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ENVIRONMENTAL BASELINE SURVEY

Relinquishment of Property and Termination of Easements for Launch Facility A-01, 446th Missile Squadron, Minuteman III Intercontinental Ballistic Missile System, Grand Forks Air Force Base, North Dakota

The United States Air Force (USAF) proposes to relinquish its jurisdiction over Launch Facility (LF) A-01 used for the Minuteman (MM) III Intercontinental Ballistic Missile (ICBM) system at Grand Forks Air Force Base (AFB), North Dakota. The LF A-01 is one of 165 land components that made up the missile system. The Air Force will offer the land for sale to the public, and terminate various easements and licenses that were executed to support the MM III system. First priority of consideration is to current adjacent landowners, who must pay fair market value.

This Environmental Baseline Survey (EBS) is in support of the Air Force's proposal to relinquish LF A-01. It accompanies an EBS on the entire 446th Missile Squadron (446 MS). The 446 MS EBS provides general information pertaining to activities and conditions that are common to all missile sites within the MS, including survey methodology, history and current use, and squadron-wide information pertaining to environmental setting, hazardous substances, and environmental investigations and sampling. The 446 MS EBS is incorporated by reference. This LF A-01 EBS provides site-specific information regarding the legal property description, environmental conditions, sampling results (if applicable), adjacent properties, compliance issues, the category finding, and recommendations. Site-specific figures, contained in Appendix A of this EBS, include: a regional map showing topography, water and wetlands (if present), and other features (Figure A-01-1); a site map also showing relevant topographic features, along with structures and sampling locations (Figure A-01-2); and a photograph taken during the site inspection (Figure A-01-3).

The EBSs were prepared in accordance with Air Force Instruction (AFI) 32-7066, *Environmental Baseline Surveys in Real Estate Transactions* (April 25, 1994), American Standards for Testing Materials (ASTM) publications E 1527-00, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, and E 1528-00, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*.

1. PURPOSE FOR THE ENVIRONMENTAL BASELINE SURVEY

The purpose of this EBS is to identify and document environmental conditions at LF A-01, in order to make decisions in connection with a property transfer.

2. SURVEY METHODOLOGY

A discussion of the general survey methodology (approach, site inspections, personnel interviews, documents reviewed, and other information sources) is provided in the 446 MS EBS. Site-specific sampling results are presented within this EBS.

3. FINDINGS FOR SUBJECT PROPERTY

LF A-01 is located in north-central Cavalier County, North Dakota, 5 miles west and 14 miles north of the town of Langdon and 85 air-miles northwest of Grand Forks AFB. Topographically, the site is on a flat to gently rolling, glacial till plain. Maximum relief in the immediate area is approximately 15 feet (see Figure A-01-1). Regional drainage is poorly developed; shallow, undrained depressions are common. A shallow, intermittent stream channel one mile west of the site provides some drainage to the north. The site is in a gently rolling, cultivated field. A topographic low, slightly

incised, southwest-trending drainage course occurs 100 feet north of the site. The ground surface slopes to this drainage at grades of 1 to 4 percent, and maximum relief within the site area is approximately 8 feet. There are no mines or quarries within a mile of LF A-01 (USGS, 1970g).

3.1. History and Current Use

The history of the site is discussed in the 446 MS EBS. The site contains approximately 10.17 acres. The legal description is found in the real property records at Grand Forks AFB.

Dresden Road, a county road, borders the site on the west (see Figure A-01-2). The U.S. Air Force boundary extends to the middle of this county road (USACE, 1964). There are no Federal or State highways adjacent to LF A-01.

A quantity-distance (safety zone) area for explosive safety extends 1,200 feet out from the launch tube; that circle includes easements of approximately 93.68 acres as well as the Air Force-owned 10.17 acres. Inhabited structures are currently prohibited in the safety zone. Three line-of-sight and azimuth marker easements cover areas of 0.07, 0.12, and 0.18 acres. An easement for the access road and utilities covers an area of 1.90 acres. The U.S. Air Force has a license from Cavalier County for the access road approach to the county road. Verification of the boundaries of these easements and their disposition, as well as a more detailed legal description, title documentation, and information on the termination of easements will be found in the Declaration of Excess prepared by the U.S. Air Force and the U.S. Army Corps of Engineers.

3.2. Environmental Setting

3.2.1. Site Inspection Summary

A site inspection was conducted at this LF in October 2000. The site was bordered in all directions by agricultural fields. Figure A-01-3 shows LF A-01 looking to the east into the site. There was slight erosion in the northwest and southwest corners of the site. There was a sinkhole, approximately 3 feet wide and 1 foot deep, located in the southwest corner of the site. Both the erosion and sinkhole were repaired after the site visit (Vetter, 2003). The site drains to the west. There was a utility pole located outside the fenceline to the north; the inside utility pole had been removed. The former antenna field (a pair of antenna wire arrays buried between 4 and 8 feet below the surface) was left in place at dismantlement, and crops have been planted at the surface.

In September 2005, Grand Forks AFB personnel verified that the sites are still clean, with no spills or dumping (Koop, 2005).

3.2.2. Geology

In 1963, prior to construction of the launch facility, two boreholes were drilled at the site to collect information on stratigraphy and groundwater at the site. One hole was drilled near the location for the launcher tube to a depth of 130 feet. Another hole was drilled near the location of the former launcher equipment building (LEB) to a depth of 65 feet. Glacial overburden at the site extends to a depth of 113 feet. At the equipment room location, the material consists essentially of silty, lean clay to the total depth of the boring (lean clay is a relatively “pure” clay with little organic matter or other additives). At the launcher location, the overburden is silty, lean clay with shale-silt sequences from 29 to 41 feet and 104 to 113 feet. This material consists of shale fragments to one-inch size in a clayey silt and crushed shale matrix. Bedrock encountered at a depth of 113 feet is the Pierre Formation of the Cretaceous age. Bedrock consists of slightly fractured, brittle, dark gray shale to 130 feet (USAF, 1963).

3.2.3. Soil

This site contains three United States Department of Agriculture (USDA) soil series (Hamerly-Tonka loams, Cresbard-Svea loams, and Svea-Buse loams) consisting of various layers of loam, clay loam, clay, silty clay, silty loam, and silty clay loam. These soils have seasonal high water tables ranging from 0.5 feet above the surface to 6.0 feet below the surface from April through June, with the exception of the Buse and Cresbard soil, where the seasonal high water table is greater than six feet. Permeability ranges from slow to moderate. The rate of water movement in the soil is very slow to moderate. None of these soils experience flooding (USDA, 1990).

3.2.4. Hydrology

The average depth to groundwater at LF A-01 is 20 feet (USAF, 1963). Mulberry Creek, which lies 3,600 feet west of the site, is in the Pembina River Drainage Basin (USGS hydrologic unit catalog (HUC) 09020313). There are no intermittent lakes within 1,500 feet or perennial lakes within one-half mile of LF A-01.

3.2.5. Wetlands

Wetlands federally delineated under the National Wetland Inventory are located 660 feet northwest of the access road, 530 feet southwest, 720 feet southwest, and 1,250 feet east of LF A-01 (USFWS, 2001). An ephemeral wetland basin (non-delineated) is located 900 feet east of the site. See Figure A-01-1.

3.3. Hazardous Substances

Hazardous materials were used at the LF for operation of the facility, as well as for maintaining and cleaning the LF (see 446 MS EBS). All hazardous materials stored on the site have been removed. During the inspection in October 2000, no evidence of hazardous waste was present and no spills were observed.

3.4. Installation Restoration Program

LF A-01 was sampled during a site investigation for the 446 MS. Two soil samples were collected and analyzed for this site at the sump pump outfall and a discretionary sample south of the LEB (see Figure A-01-2). Soils were sampled for diesel range organics (DRO), gasoline range organics (GRO), priority pollutant metals (PPM), and polychlorinated biphenyls (PCB). All sample results were below regulatory limits (USAF, 1999b). This site is not part of the Grand Forks AFB Installation Restoration Program (IRP) and no remediation is required.

3.5. Storage Tanks

At LF A-01, an 11,000-gallon deep-buried diesel tank was abandoned in place prior to dismantlement of the facilities. This tank was closed in accordance with state regulations. A 100-gallon diesel fuel tank was removed from the LEB. A shallow-buried 4,000-gallon diesel fuel tank was removed from a location just south of the LEB. All removal and closure activities were coordinated with the North Dakota Department of Health (NDDH). Soil testing conducted at the time of closure did not detect hydrocarbons (USAF, 2000c).

3.6. Oil/Water Separators

There were no oil/water separators at LF A-01.

3.7. Pesticides

Herbicides (Arsenal, Sprakil, Weed Blast, Pramitol, and Bromocil) were used at regular intervals between the early 1960s and the late 1990s to control weed and plant growth at LF A-01. Modeling of herbicide degradation based on application rates of applied formulations indicated that only negligible residues would remain within one year of application (USAF, 1999a). Recent spot treatments have been used sporadically to supplement mowing for noxious weed control. Since these treatments involved smaller treatment areas and lower application rates than the previously modeled applications, they would also be predicted to result in negligible pesticide residues at LF A-01 after one year.

3.8. Medical or Biohazardous Waste

In the event of a physical injury that resulted in generation of medical waste during maintenance activities at the site, all solid waste (including medical waste) generated at the site was gathered and transported for disposal at Grand Forks AFB. There were no biohazardous wastes associated with the LF. Consequently, there is no risk of exposure to medical or biohazardous wastes at the dismantled sites.

3.9. Ordnance

Ballistic gas generators were formerly at the LFs to rapidly open the launcher door in the event of a missile launch. Each LF contained munitions as actuators for the generators, and ordnance was associated with the MM missile components. A 1,200-foot quantity distance arc (safety zone) was established for explosive safety at each LF to preclude any inhabited structures within this zone. No detonations during handling of any ordnance occurred at the Grand Forks AFB deployment area (Rudolf, 1997). The ballistic gas generators and missiles were removed during the deactivation process. No explosives or ordnance remain at the LF.

3.10. Radioactive Waste

Radioactive waste is discussed in the 446 MS EBS. No leaks of radioactive materials are known to have occurred at Grand Forks AFB or in the deployment area (Rudolf, 1998). There is no risk of radiation exposure caused by past use of this site.

3.11. Solid Waste

Solid waste generated at LF A-01 during maintenance activities was collected and returned to Grand Forks AFB for proper disposal. During dismantlement activities, any solid wastes generated (except construction rubble) were collected and disposed off-site by a government contractor. Construction rubble was placed down the launch tube during dismantlement, and the launch tube was subsequently sealed with concrete to limit access to the subsurface. Although the site may qualify as an inert solid waste landfill under *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01, a permit was not needed because all construction rubble placed in the launch tube was generated on Air Force property. All appropriate design criteria (including a geo-textile membrane at a depth of about 8 feet and appropriate fill) were followed for a permit-exempt inert solid waste landfill according to the *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01. There are no other solid waste disposal sites at LF A-01.

3.12. Groundwater

There were PCBs in coatings on the access and ventilation shafts, and possibly on the deep-buried 11,000-gallon underground storage tank (UST) that was closed in place at LF A-01. Groundwater

monitoring at selected LFs is currently underway because of the possibility that PCBs from these coatings may leach into shallow groundwater (see Section 3.16 and the 446 MS EBS).

3.13. Wastewater Treatment, Collection, and Discharge

No wastewater treatment, collection, or discharge was associated with the LF.

3.14. Drinking Water Quality

No potable water access was developed at any LF. In accordance with a groundwater monitoring plan for the missile deployment area that was developed by Grand Forks AFB and approved by the United States Environmental Protection Agency (USEPA) Region VIII, no drinking water wells can be installed at LF A-01 for at least 50 years (see Section 3.12).

3.15. Asbestos

The diesel electric unit (DEU) exhaust systems in the LEB contained asbestos insulation under a metal sheet covering. The DEU was removed from the site during dismantlement activities. None of the USTs at the LF tested positive for asbestos (Vetter, 2001). Some of the buried structures at the LF, such as the LEB access shaft, could contain asbestos. Any asbestos at the LFs was buried as part of the subsurface structure.

3.16. Polychlorinated Biphenyls

All equipment (e.g., electric filters, panels, capacitors, and light ballasts) that potentially contained PCBs was removed during the environmental safing process of the LF deactivation. However, the 11,000-gallon deep-buried UST closed in place at A-01 may have a PCB coating. All other buried structures may also be covered with a PCB coating (Vetter, 2001).

Samples for analyzing PCBs were collected at selected LFs from waterproof coatings on ventilation and access shafts and from adjacent soils, but site LF A-01 was not included in this sampling process. Samples taken from sump pump outfalls at all LFs were also analyzed for PCBs. The concentrations detected were all below action criteria levels. A more complete discussion of in-situ PCB disposal and sampling is included in the EBS for the 446 MS Sites (USAF, 2004).

3.17. Radon

Radon is generally a concern only for occupied dwellings. Therefore, no radon monitoring was conducted at the site (Rudolf, 2001).

3.18. Lead-based Paint

Lead-based paint (LBP) may have been used on interior and exterior surfaces in buildings constructed prior to 1978. At the LF, the interior of the launcher and LEB contained LBP. Although the lead content of the particular paint used is unknown, the paint used at the LF sites is conservatively assumed to contain 20 percent lead by weight. The paint also may have contained other heavy metals, such as chromium and mercury. Subsurface structures potentially coated with LBP were buried in place. During Rivet Minuteman Integrated Life Extension (MILE) activities, underground structures were brought to the surface for maintenance, and portions of the original paint were chipped off and left on the topside ground surface of each site (Hustad, 1998). A soil sample for lead collected at the sump pump outfall (see Figure A-01-2) indicated 60 ppm, and a discretionary soil sample south of the LEB (see Figure A-01-2) indicated 8.2 ppm (USAF, 1999b). Although a standard has not been established for rural areas, these values are well below the residential standard of 1,200 ppm.

Soil samples were also analyzed for other heavy metals, such as cadmium, chromium, and mercury. Sump pump sample readings were 9.0 ppm for chromium and non-detect for cadmium and mercury. Discretionary sample readings were 9.4 ppm for chromium, 0.69 ppm for cadmium, and non-detect for mercury. Regulatory limits have not been established for soil contamination for these metals. The LF structures did not meet the definition of target housing for lead-based paint regulation.

4. FINDINGS FOR ADJACENT PROPERTIES

The site is surrounded by agricultural areas used for crop production. There are no National Priority List sites in North Dakota. No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), treatment, storage, and/or disposal (TSD), or Emergency Response Notification System (ERNS) sites are located within search distances, as defined by ASTM Standards (NRC, 2005; NDDH, 2002; NDDH, 2005; USEPA, 2005a; USEPA, 2005b; USEPA, 2005c; USEPA, 2005d).

5. APPLICABLE REGULATORY COMPLIANCE ISSUES

Compliance issues are environmental conditions that may affect the transfer or use of the subject property. These conditions include historic property, prehistoric sites, traditional cultural resources, sensitive habitats, threatened or endangered species, wetlands, floodplains, seismic conditions, mineral resources, prime and unique farmlands or timberlands, and water rights. There are no prehistoric or traditional cultural resources at the site.

5.1. Historic Property

The State Historical Society of North Dakota (SHSND) and the Advisory Council were consulted as part of the Environmental Impact Statement for the Minuteman III Dismantlement (USAF, 1999a). LF A-01 was considered eligible for listing in the National Register of Historic Places. However, the U.S. Air Force and the SHSND have negotiated a Programmatic Agreement to retain a Missile Alert Facility (MAF) (O-0) and LF (N-33) in the 448 MS. No restrictions for transfer of the property at LF A-01 are required.

5.2. Sensitive Habitats

LF A-01 is not adjacent to or within any protected areas, such as national wildlife refuges, national or state wildlife management areas, or waterfowl protection areas. No disturbance to protected habitats would likely occur if the land is sold; therefore, no restrictions for the transfer of the property are required.

5.3. Threatened and Endangered Species

No known threatened or endangered plant or animal species, or suitable habitat for such species, occur within the LF (USAF, 1999a). No impacts to any protected species or their habitat should occur if the property is sold; therefore, no restrictions are required.

5.4. Wetlands

The National Wetland Inventory has identified wetlands within 1,500 feet of the Air Force property boundary (see Section 3.5.4 and Appendix A). Although it is unlikely that a future owner of this site would disturb these wetlands, they may be subject to the *Clean Water Act*. No disturbance would result from the actual transfer of property.

5.5. Floodplains

LF A-01 is not within an area designated as a 100-year floodplain (USAF, 1999a). No impacts to any type of floodplain would occur if the property is sold; therefore, no restrictions are required.

5.6. Seismic Conditions

LF A-01 is situated in Seismic Hazard Zone 0. Seismic conditions are not a concern in the vicinity of the LF; therefore, no restrictions are required.

5.7. Mineral Resources

No economically recoverable mineral resources have been identified in the vicinity of the LF; therefore, no restrictions are required.

5.8. Prime and Unique Farmlands or Timberlands

Part of this property is within prime and unique farmlands, but no timberlands have been designated in the vicinity of the LF. The Svea-Barnes and Hamerly-Tonka complexes are found on the entire site, except for a small portion of the northwest corner of the property. The portion of this site designated as prime farmland is subject to the *Farmland Protection Policy Act* (Public Law 97-98).

5.9. Water Rights

If any water rights were acquired, they will be addressed in the Report of Excess to be prepared for each site by the U.S. Air Force and the U.S. Army Corps of Engineers (Noordam, 2001).

6. CONCLUSIONS

The following finding is based on a site inspection of the LF A-01 and a review of the EBS. The LF has been designated as:

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require removal or remedial response.

No data gaps have been identified.

7. RECOMMENDATIONS

The findings of this EBS indicate minimal potential for environmental contamination at LF A-01. Therefore, it is recommended that the Air Force pursue the sale of the LF A-01 property associated with the 446 MS of the former Minuteman III Missile System at Grand Forks AFB, ND.

Due to the presence of PCBs in coatings used on certain structures, there is a potential for low levels of PCB contamination in groundwater, and monitoring is underway (see the 446 MS EBS). Consequently, there is a restriction on excavating to a depth greater than 2 feet (within the fenceline), disturbing the gravel mound at the site of the former launch tube, or drilling to supply drinking water, and this restriction should be disclosed to potential purchasers.

Various structures were left buried on the property (within and outside of the fence). An antenna field is buried about 4 feet below the surface (Klaus, 2003) to the south and southwest of the fenceline. A hardened intersite cable and associated junction boxes, connected to the MAF, are also buried about 4 feet below the surface. Line of sight markers are buried to a depth of 8 feet. Any of these buried structures could potentially be encountered while plowing fields on this property.

The portion of this land designated as prime farmland (discussed in Section 5.8) is subject to the *Farmland Protection Policy Act* (Public Law 97-98). Restrictions would apply to the conversion of the land to a non-agricultural use.

8. CERTIFICATIONS

A search of Air Force files has revealed that hazardous substances, as that term is defined by the Air Force and in CERCLA, as amended, were used or stored for one year or more, known to have been released, or were disposed of on LF A-01, associated with the 446 MS, Grand Forks AFB, ND, as described below. Section 8.1 addresses hazardous substances; PCBs and asbestos-containing materials (ACM) are addressed separately in Sections 8.2 and 8.3, respectively.

8.1. Hazardous Substances

The following notice provides the available information discovered as a result of a search of Air Force files pertaining to hazardous substances known to have been stored, released, or disposed of at the Site:

- **Petroleum Constituents.** Petroleum-containing materials were used at LF A-01 from approximately 1964 to 1998. In 1998 VOC and TPH concentrations of surficial soil at the sump pump outfall were non-detectable. The petroleum diesel UST was closed in-place in 1999. Closure documentation was submitted to NDDH, who responded that the closure reports were satisfactory and that no further action will be required (NDDH, 2004).
- **Lead-Based Paint (LBP).** LBP was identified in the sodium chromate coolant tank coating; the tank was removed and disposed off-site as hazardous waste. LBP was assumed to exist in the launcher rubble, which was tested at selected LFs for toxicity characteristic leaching procedure (TCLP) lead; all concentrations were less than the action limit.
- **Priority Pollutant List Metals (PPL).** Soil samples for PPL metals (silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc) were collected at the sump pump outfall at all LFs, and randomly at other locations at LFs. All samples that indicated the presence of metals were consistent with local background concentrations and/or were less than levels that required action by the USEPA or NDDH.
- **Chromium (CAS# 7440-47-3).** An unquantified amount of chromium may have been contained in LBP used as coatings for underground structures, and if present is buried in the launch tube rubble; sampling results were below action levels.
- **Sodium Chromate (CAS# 7775-11-3).** About 88 pounds of sodium chromate coolant solution was stored or used at LF A-01 from approximately 1964 to 1998. All fluid and associated equipment was removed from the site by 1998 during the environmental safing process.
- **Miscellaneous.** Limited amounts of hydraulic fluid, lead, mercury, cadmium, pesticides, solvents, coolants, paints, ordnance, and lead acid batteries were used and/or stored at LF A-1. All materials were removed during deactivation, and no releases other than those deemed *de minimis* were identified. No concentrations of these and/or related constituents above their respective action levels were identified during environmental testing.

The Air Force has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substances released, disposed of, or stored at LF A-01, which is identified as excess to U.S. Air Force requirements and proposed for disposal.

8.2. Certification Of Polychlorinated Biphenyls (PCB)

The Real Property at LF A-01 associated with the former 446 MS, Grand Forks AFB, ND, is subject to restrictions due to PCBs as outlined below:

Non-liquid Polychlorinated Biphenyls (CAS# 1336-36-3). Non-liquid PCBs were used in waterproofing materials during construction at the Site beginning in 1964. Non-liquid PCBs are assumed to still be present in waterproofing materials at the LF based on representative sampling. Testing in 1997 revealed a PCB coating on some tanks at MAFs; a shallow buried tanks were removed from the site. The waterproof coating on one deep buried tank was tested for PCBs and none were detected. These tanks were closed in place. Soils adjacent to the removed tanks had PCB concentrations ranging from non-detect to 14 ppm. The total PCB concentrations for waterproofing at LFs (sampled at ventilation shafts and access shafts) ranged from non-detect to 38,000 ppm. All TCLP-PCB concentrations were less than 10 ppb (ranging from non-detect to 6 ppb). The UST was closed in place and most of the piping and conduit was disposed as *Toxic Substance Control Act*-PCB waste, and a limited amount of piping and conduit remains buried at the site.

The Air Force also conducted testing for non-liquid PCBs in soil at all LFs in support of the 2001 Groundwater Monitoring Plans (GWMP) (USAF, 2000e, 2001c). The GWMP concluded that the type of PCB material in the UST and rubble coatings has a low potential to leach into or impact environmental media, and it therefore constitutes an unlikely source of significant risk to human health or the environment. Nevertheless, due to PCB-containing coating material that may exist on buried rubble, piping and conduit, and intact support building and launcher (silo) coatings, the following deed restrictions apply to LF A-01, as established in cooperation with the USEPA, Region VIII:

Any future private owners of the Site will be restricted from subsurface development, including water well construction. No drilling, excavation, trenching, or digging within the gravel-covered mound area within the fenceline, or that exceeds 2 feet below existing grade outside of the mounded area, shall be allowed, without advance approval by USEPA Region VIII.

As part of the Air Force's continuing efforts to verify that the above-mentioned non-liquid PCBs do not pose a significant risk to human health or the environment, five LFs, not including LF A-01, have ongoing long-term groundwater monitoring to allow further evaluation of the potential for impacts from non-liquid PCBs (and related constituents) at all LFs. The results, which to-date have been below action levels, will be used to evaluate the need, if any, for further action at the LFs. LF A-01 was not recommended for long-term monitoring, based on an evaluation of past PCB investigations.

Low concentrations of total PCBs (0.05 ppm) were identified in representative samples of the HICS inner cable components, a short section of which is buried at LF A-01. As a result, the following deed restriction applies:

If HICS cabling is removed (at the landowner's discretion and effort), the covering should not be burned because of the potential to release carbon monoxide from polysulfide components within the inner covering.

Liquid Polychlorinated Biphenyls In Soil (CAS# 11097-69-1). Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. The sump pump outfall soil was sampled between 1998 and 2000 to assess the potential of a liquid PCB release. Concentrations for PCBs ranged from non-detect to 4.1 ppm (well below the USEPA's cleanup action level of 50 ppm) and no remedial action was required.

8.3. Certification Of Asbestos-Containing Material (ACM)

The Real Property on LF A-01 associated with the 446 MS, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

At the LFs, the only item known to contain asbestos was the exhaust system for the diesel electric unit, which was removed as part of site dismantlement. The coatings found on some buried structures (such as the LEB access shaft) at the LFs may contain asbestos. None of the tanks at the LF sites tested positive for asbestos. Any asbestos at the LFs was buried as part of the subsurface structure (disposed of in place, on site). Access to these ACM remnants by future owners is limited by restrictions on subsurface development due to PCBs (see PCB Certification, Section 8.2).

Subject to the above constraints, the property containing the former LF A-01 is safe for human health and the environment.

Certified by: *Randy McCart* October 13, 2005
Randy McCart
Project Manager
LABAT-ANDERSON INCORPORATED
Bellevue, Nebraska
Date

Approved by: _____
Gary T. Maher, GS-15
Chief, Environmental Division
Headquarters U.S. Air Force Space Command
Peterson Air Force Base, Colorado
Date

APPENDIX A -- MAPS AND PHOTOGRAPHS

- Figure A-01-1 Features Surrounding Former Launch Facility A-01
- Figure A-01-2 Site Map of Former Launch Facility A-01
- Figure A-01-3 View of Former Launch Facility A-01 Facing West

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ENVIRONMENTAL BASELINE SURVEY

Relinquishment of Property and Termination of Easements for Launch Facility B-11, 446th Missile Squadron, Minuteman III Intercontinental Ballistic Missile System, Grand Forks Air Force Base, North Dakota

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2. SURVEY METHODOLOGY

A discussion of the general survey methodology (approach, site inspections, personnel interviews, documents reviewed, and other information sources) is provided in the 446 MS EBS. Site-specific sampling results are presented within this EBS.

3. FINDINGS FOR SUBJECT PROPERTY

Site B-11 is in northeast Cavalier County, North Dakota, 10.5 miles east and 10 miles north of the town of Langdon and 74 air-miles north-northwest of Grand Forks AFB. Topographically, the site is on a gently rolling, glacial till plain. Maximum relief within the site area is 6 feet (see Figure B-11-1). Regional drainage is moderately developed in the area by the Pembina and Little South Pembina Rivers (USGS, 1972l). There are no mines or quarries within a mile of the property lines for B-11.

3.1. History and Current Use

The history of the site is discussed in the 446 MS EBS. The site contains approximately 10.17 acres. The legal description is found in the real property records at Grand Forks AFB.

A county road borders the site on the south (see Figure B-11-2). The U.S. Air Force boundary extends to the middle of this county road (USACE, 1964). There are no Federal or State Highways adjacent to B-11.

A quantity-distance (safety zone) area for explosive safety extends 1,200 feet out from the launch tube; that circle includes easements of approximately 93.68 acres as well as the Air Force-owned 10.17 acres. Inhabited structures are currently prohibited in the safety zone. Three line-of-sight and azimuth marker easements cover areas of 0.06, 0.13, and 0.17 acres. An easement for the access road and utilities cover an area of 1.20 acres. The U.S. Air Force has a license from Cavalier County for the access road approach to the county road. Verification of the boundaries of these easements and their disposition, as well as a more detailed legal description, title documentation, and information on the termination of easements will be found in the Declaration of Excess prepared by the U.S. Air Force and the U.S. Army Corps of Engineers.

3.2. Environmental Setting

3.2.1. Site Inspection Summary

A site inspection was conducted at this LF in October 2000. The site was bordered in all directions by agricultural fields. Figure B-11-3 shows LF B-11 looking to the north into the site. There was slight erosion on the east and west side of the site; all erosion was repaired after the site visit (Vetter, 2003). The drainage was positive off the site. There was a utility pole located outside of the fenceline to the north. The inside utility pole had been removed. The former antenna field (a pair of antenna wire arrays buried between 4 and 8 feet below the surface) was left in place at dismantlement, and was overgrown with weeds. The landowner had some equipment and an old car parked on the site.

In September 2005, Grand Forks AFB personnel verified that the sites are still clean, with no spills or dumping (Koop, 2005).

3.2.2. Geology

In 1963, prior to construction of the launch facility, two boreholes were drilled at the site to collect information on stratigraphy and groundwater at the site. One hole was drilled near the location for the launcher tube to a depth of 130 feet. Another hole was drilled near the location of the former launcher equipment building (LEB) to a depth of 65 feet. Glacial overburden extends to a depth of 16 to 29 feet. The material at the launcher location consists of fine sand and silty clay to 11 feet and clayey silt or silty clay containing numerous shale fragments to 29 feet. A fine to coarse sand unit occurs from 24 to 25.5 feet. At the former equipment facility location the material consists of silty, lean clay to 9 feet underlain to 16 feet by silty clay with numerous shale fragments. Bedrock encountered below depths of 16 and 29 feet is the Pierre formation of Cretaceous age. Bedrock consists of highly to moderately fractured, thin-bedded shale to the total depth of the borings (USAF, 1963).

3.2.3. Soil

This site contains three United States Department of Agriculture (USDA) soil series (Vallers-Hamerly loams, Waukon loam, and Hamerly-Tonka loams) consisting of various layers of loam, clay loam, clay, and silty clay loam. These soils have seasonal high water tables ranging from 0.5 feet above the surface to 4.0 feet below the surface from April through July, with the exception of the

Waukon soil, where the seasonal high water table is greater than six feet. Permeability range is slow to moderate. The rate of water movement in the soil is moderately slow to moderate. The Tonka and Vallery are hydric soils experiencing saturation and ponding. None of these soils experience flooding (USDA, 1990).

3.2.4. Hydrology

The depth to groundwater at B-11 is 5 feet (USAF, 1963). Intermittent branches of the Pembina River pass through the access road and 750 feet southeast, 2,000 feet southeast, 1,750 feet northwest and 1,000 feet northwest of B-11. These streams are in the Pembina River Drainage Basin (USGS hydrologic unit catalog (HUC) 09020313) (USGS, 2001). An intermittent lake lies 371 feet northwest of B-11. There are no perennial lakes within one-half mile of B-11.

3.2.5. Wetlands

Federally delineated wetlands under the National Wetland Inventory are located 1,273 feet southwest of LF B-11 (USFWS, 2001). See Figure B-11-1

3.3. Hazardous Substances

Hazardous materials were used at the LF for operation of the facility, as well as for maintaining and cleaning the LF (see 446 MS EBS). All hazardous materials stored on the site have been removed. During the inspection in October 2000, no evidence of hazardous waste was present and no spills were observed.

3.4. Installation Restoration Program

LF B-11 was sampled during a site investigation for the 446 MS. Four samples were collected and analyzed for this site at the sump pump outfall, a background sample southeast of the LEB, a waterproof coating sample from the access shaft, and an adjacent soil sample (see Figure B-11-2). Soils were sampled for diesel range organics (DRO), gasoline range organics (GRO), priority pollutant metals (PPM), and polychlorinated biphenyls (PCB). All sample results were below regulatory limits (USAF, 1999b). This site is not part of the Grand Forks AFB Installation Restoration Program and no remediation is required.

3.5. Storage Tanks

At LF B-11, an 11,000-gallon deep-buried diesel tank was abandoned in place prior to dismantlement of the facilities. This tank was closed in accordance with state regulations. A 100-gallon diesel fuel tank was removed from the LEB. A shallow-buried 4,000-gallon diesel fuel tank was removed from a location just south of the LEB. All removal and closure activities were coordinated with the North Dakota Department of Health (NDDH). Soil testing conducted at the time of closure did not detect hydrocarbons (USAF, 2000c).

3.6. Oil/Water Separators

There were no oil/water separators at LF B-11.

3.7. Pesticides

Herbicides (Arsenal, Sprakil, Weed Blast, Pramitol, and Bromocil) were used at regular intervals between the early 1960s and the late 1990s to control weed and plant growth at LF B-11. Modeling of herbicide degradation based on application rates of applied formulations indicated that only negligible residues would remain within one year of application (USAF, 1999a). Recent spot treatments have been used sporadically to supplement mowing for noxious weed control. Since

these treatments involved smaller treatment areas and lower application rates than the previously modeled applications, they would also be predicted to result in negligible pesticide residues at LF B-11 after one year.

3.8. Medical or Biohazardous Waste

In the event of a physical injury that resulted in generation of medical waste during maintenance activities at the site, all solid waste (including medical waste) generated at the site was gathered and transported for disposal at Grand Forks AFB. There were no biohazardous wastes associated with the LF. Consequently, there is no risk of exposure to medical or biohazardous wastes at the dismantled sites.

3.9. Ordnance

Ballistic gas generators were formerly at the LFs to rapidly open the launcher door in the event of a missile launch. Each LF contained munitions as actuators for the generators, and ordnance was associated with the MM missile components. A 1,200-foot quantity distance arc (safety zone) was established for explosive safety at each LF to preclude any inhabited structures within this zone. No detonations during handling of any ordnance occurred at the Grand Forks AFB deployment area (Rudolf, 1997). The ballistic gas generators and missiles were removed during the deactivation process. No explosives or ordnance remain at the LF.

3.10. Radioactive Waste

Radioactive waste is discussed in the 446 MS EBS. No leaks of radioactive materials are known to have occurred at Grand Forks AFB or in the deployment area (Rudolf, 1998). There is no risk of radiation exposure caused by past use of this site.

3.11. Solid Waste

Solid waste generated at LF B-11 during maintenance activities was collected and returned to Grand Forks AFB for proper disposal. During dismantlement activities, any solid wastes generated (except construction rubble) were collected and disposed off-site by a government contractor. Construction rubble was placed down the launch tube during dismantlement, and the launch tube was subsequently sealed with concrete to limit access to the subsurface. Although the site may qualify as an inert solid waste landfill under *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01, a permit was not needed because all construction rubble placed in the launch tube was generated on Air Force property. All appropriate design criteria (including a geo-textile membrane at a depth of about 8 feet and appropriate fill) were followed for a permit-exempt inert solid waste landfill according to the *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01. There are no other solid waste disposal sites at LF B-11.

3.12. Groundwater

There were PCBs in coatings on the access and ventilation shafts, and possibly on the deep-buried 11,000-gallon underground storage tank (UST) that was closed in place at LF B-11. Groundwater monitoring at selected LFs is currently underway because of the possibility that PCBs from these coatings may leach into shallow groundwater (see Section 3.16 and the 446 MS EBS).

3.13. Wastewater Treatment, Collection, and Discharge

No wastewater treatment, collection, or discharge was associated with the LF.

3.14. Drinking Water Quality

No potable water access was developed at any LF. In accordance with a groundwater monitoring plan for the missile deployment area that was developed by Grand Forks AFB and approved by the United States Environmental Protection Agency (USEPA) Region 8, no shallow drinking water wells can be installed at LF B-11 for at least 50 years (see Section 3.12).

3.15. Asbestos

The diesel electric unit (DEU) exhaust systems in the LEB contained asbestos insulation under a metal sheet covering. The DEU was removed from the site during dismantlement activities. None of the USTs at the LF tested positive for asbestos (Vetter, 2001). Some of the buried structures at the LF, such as the LEB access shaft, could contain asbestos. Any asbestos at the LFs was buried as part of the subsurface structure.

3.16. Polychlorinated Biphenyls

All equipment (e.g., electric filters, panels, capacitors, and light ballasts) that potentially contained PCBs was removed during the environmental safing process of the LF deactivation. However, the 11,000-gallon deep-buried UST closed in place at B-11 may have a PCB coating. All other buried structures may also be covered with a PCB coating (Vetter, 2001).

Samples for analyzing PCBs were collected at selected LFs from waterproof coatings on ventilation and access shafts and from adjacent soils. Samples taken from sump pump outfalls at all LFs were also analyzed for PCBs. The concentrations detected were all below action criteria levels. A more complete discussion of in-situ PCB disposal and sampling is included in the EBS for the 446 MS Sites.

3.17. Radon

Radon is generally a concern only for occupied dwellings. Therefore, no radon monitoring was conducted at the site (Rudolf, 2001).

3.18. Lead-based Paint

Lead-based paint (LBP) may have been used on interior and exterior surfaces in buildings constructed prior to 1978. At the LF, the interior of the launcher and LEB contained LBP. Although the lead content of the particular paint used is unknown, the paint used at the LF sites is conservatively assumed to contain 20 percent lead by weight. The paint also may have contained other heavy metals, such as chromium and mercury. Subsurface structures potentially coated with LBP were buried in place. During Rivet Minuteman Integrated Life Extension (MILE) activities, underground structures were brought to the surface for maintenance, and portions of the original paint were chipped off and left on the topside ground surface of each site (Hustad, 1998). A soil sample for lead collected at the sump pump outfall (see Figure B-11-2) indicated 6.5 ppm, and a background soil sample southeast of the LEB (see Figure B-11-2) indicated 7.6 ppm (USAF, 1999b). Although a standard has not been established for rural areas, these values are well below the residential standard of 1,200 ppm.

Soil samples were also analyzed for other heavy metals, such as cadmium, chromium, and mercury. Readings for the sump pump sample were 12.0 ppm for chromium and non-detect for cadmium and mercury. Readings for the background sample were 10.0 ppm for chromium and non-detect for cadmium and mercury. Regulatory limits have not been established for soil contamination for these metals. The LF structures did not meet the definition of target housing for LBP regulation.

4. FINDINGS FOR ADJACENT PROPERTIES

The site is surrounded by agricultural areas used for crop production. There are no National Priority List sites in North Dakota. No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), treatment, storage, and/or disposal (TSD), or Emergency Response Notification System (ERNS) sites are located within search distances, as defined by ASTM Standards (NRC, 2005; NDDH, 2002; NDDH, 2005; USEPA, 2005a; USEPA, 2005b; USEPA, 2005c; USEPA, 2005d).

5. APPLICABLE REGULATORY COMPLIANCE ISSUES

Compliance issues are environmental conditions that may affect the transfer or use of the subject property. These conditions include historic property, prehistoric sites, traditional cultural resources, sensitive habitats, threatened or endangered species, wetlands, floodplains, seismic conditions, mineral resources, prime and unique farmlands or timberlands, and water rights. There are no prehistoric or traditional cultural resources at the site.

5.1. Historic Property

The State Historical Society of North Dakota (SHSND) and the Advisory Council were consulted as part of the Environmental Impact Statement for the Minuteman III Dismantlement (USAF, 1999a). LF B-11 was considered eligible for listing in the National Register of Historic Places. However, the U.S. Air Force and the SHSND have negotiated a Programmatic Agreement to retain a Missile Alert Facility (MAF) (O-0) and LF (N-33) in the 448 MS. No restrictions for transfer of the property at LF B-11 are required.

5.2. Sensitive Habitats

LF B-11 is not adjacent to or within any protected areas, such as national wildlife refuges, national or state wildlife management areas, or waterfowl protection areas. No disturbance to protected habitats would likely occur if the land is sold; therefore, no restrictions for the transfer of the property are required.

5.3. Threatened and Endangered Species

No known threatened or endangered plant or animal species, or suitable habitat for such species, occur within the LF (USAF, 1999a). No impacts to any protected species or their habitat should occur if the property is sold; therefore, no restrictions are required.

5.4. Wetlands

The National Wetland Inventory has identified wetlands within 1,500 feet of the Air Force property boundary (see Section 3.5.4 and Appendix A). Although it is unlikely that a future owner of this site would disturb these wetlands, they may be subject to the *Clean Water Act*. No disturbance would result from the actual transfer of property.

5.5. Floodplains

LF B-11 is not within an area designated as a 100-year floodplain (USAF, 1999a). No impacts to any type of floodplain would occur if the property is sold; therefore, no restrictions are required.

5.6. Seismic Conditions

LF B-11 is situated in Seismic Hazard Zone 0. Seismic conditions are not a concern in the vicinity of the LF; therefore, no restrictions are required.

5.7. Mineral Resources

No economically recoverable mineral resources have been identified in the vicinity of the LF; therefore, no restrictions are required.

5.8. Prime and Unique Farmlands or Timberlands

Part of this property is within prime and unique farmlands, but no timberlands have been designated in the vicinity of the LF. The Hamerly-Tonka complex and Wauhon series are found on the entire site, except for a small portion of the northeast and southeast corners of the property. The portion of this site designated as prime farmland is subject to the *Farmland Protection Policy Act* (Public Law 97-98).

5.9. Water Rights

If any water rights were acquired, they will be addressed in the Report of Excess to be prepared for each site by the U.S. Air Force and the U.S. Army Corps of Engineers (Noordam, 2001).

6. CONCLUSIONS

The following finding is based on a site inspection of the LF B-11 and a review of the EBS. The LF has been designated as:

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require removal or remedial response.

No data gaps have been identified.

7. RECOMMENDATIONS

The findings of this EBS indicate minimal potential for environmental contamination at LF B-11. Therefore, it is recommended that the Air Force pursue the sale of the LF B-11 property associated with the 446 MS of the former Minuteman III Missile System at Grand Forks AFB, ND.

Due to the presence of PCBs in coatings used on certain structures, there is a potential for low levels of PCB contamination in groundwater, and monitoring is underway (see the 446 MS EBS). Consequently, there is a restriction on excavating to a depth greater than 2 feet (within the fenceline), disturbing the gravel mound at the site of the former launch tube, or drilling to supply drinking water, and this restriction should be disclosed to potential purchasers.

Various structures were left buried on the property (within and outside of the fence). An antenna field is buried about 4 feet below the surface (Klaus, 2003) to the south and southwest of the fenceline. A hardened intersite cable and associated junction boxes, connected to the MAF, are also buried about 4 feet below the surface. Line of sight markers are buried to a depth of 8 feet. Any of these buried structures could potentially be encountered while plowing fields on this property.

The portion of this land designated as prime farmland (discussed in Section 5.8) is subject to the *Farmland Protection Policy Act* (Public Law 97-98). Restrictions would apply to the conversion of the land to a non-agricultural use.

8. CERTIFICATIONS

A search of Air Force files has revealed that hazardous substances, as that term is defined by the Air Force and in CERCLA, as amended, were used or stored for one year or more, known to have been released, or were disposed of on LF B-11, associated with the 446 MS, Grand Forks AFB, ND, as described below. Section 8.1 addresses hazardous substances; PCBs and asbestos-containing materials (ACM) are addressed separately in Sections 8.2 and 8.3, respectively.

8.1. Hazardous Substances

The following notice provides the available information discovered as a result of a search of Air Force files pertaining to hazardous substances known to have been stored, released, or disposed of at the Site:

- **Petroleum Constituents.** Petroleum-containing materials were used at LF B-11 from approximately 1964 to 1998. In 1998 VOC and TPH concentrations of surficial soil at the sump pump outfall were non-detectable. The petroleum diesel UST was closed in-place in 1999. Closure documentation was submitted to NDDH, who responded that the closure reports were satisfactory and that no further action will be required (NDDH, 2004).
- **Lead-Based Paint (LBP).** LBP was identified in the sodium chromate coolant tank coating; the tank was removed and disposed off-site as hazardous waste. LBP was assumed to exist in the launcher rubble, which was tested at selected LFs for toxicity characteristic leaching procedure (TCLP) lead; all concentrations were less than the action limit.
- **Priority Pollutant List Metals (PPL).** Soil samples for PPL metals (silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc) were collected at the sump pump outfall at all LFs, and randomly at other locations at LFs. All samples that indicated the presence of metals were consistent with local background concentrations and/or were less than levels that required action by the USEPA or NDDH.
- **Chromium (CAS# 7440-47-3).** An unquantified amount of chromium may have been contained in LBP used as coatings for underground structures, and if present is buried in the launch tube rubble; sampling results were below action levels.
- **Sodium Chromate (CAS# 7775-11-3).** About 88 pounds of sodium chromate coolant solution was stored or used at LF B-11 from approximately 1964 to 1998. All fluid and associated equipment was removed from the site by 1998 during the environmental safing process.
- **Miscellaneous.** Limited amounts of hydraulic fluid, lead, mercury, cadmium, pesticides, solvents, coolants, paints, ordnance, and lead acid batteries were used and/or stored at LF B-11. All materials were removed during deactivation, and no releases other than those deemed *de minimis* were identified. No concentrations of these and/or related constituents above their respective action levels were identified during environmental testing.

The Air Force has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substances released, disposed of, or stored at LF B-11, which is identified as excess to U.S. Air Force requirements and proposed for disposal.

8.2. Certification Of Polychlorinated Biphenyls (PCB)

The Real Property at LF B-11 associated with the former 446 MS, Grand Forks AFB, ND, is subject to restrictions due to PCBs as outlined below:

Non-liquid Polychlorinated Biphenyls (CAS# 1336-36-3). Non-liquid PCBs were used in waterproofing materials during construction at the Site beginning in 1964. Non-liquid PCBs are assumed to still be present in waterproofing materials at the LF based on representative sampling. Testing in 1997 revealed a PCB coating on some tanks at MAFs; a shallow buried tanks were removed from the site. The waterproof coating on one deep buried tank was tested for PCBs and none were detected. These tanks were closed in place. Soils adjacent to the removed tanks had PCB concentrations ranging from non-detect to 14 ppm. The total PCB concentrations for waterproofing at LFs (sampled at ventilation shafts and access shafts) ranged from non-detect to 38,000 ppm. All

TCLP-PCB concentrations were less than 10 ppb (ranging from non-detect to 6 ppb). The UST was closed in place and most of the piping and conduit was disposed as *Toxic Substance Control Act*-PCB waste, and a limited amount of piping and conduit remains buried at the site.

The Air Force also conducted testing for non-liquid PCBs in soil at all LFs in support of the 2001 Groundwater Monitoring Plans (GWMP) (USAF, 2000e, 2001c). The GWMP concluded that the type of PCB material in the UST and rubble coatings has a low potential to leach into or impact environmental media, and it therefore constitutes an unlikely source of significant risk to human health or the environment. Nevertheless, due to PCB-containing coating material that may exist on buried rubble, piping and conduit, and intact support building and launcher (silo) coatings, the following deed restrictions apply to LF B-11, as established in cooperation with the USEPA, Region VIII:

Any future private owners of the Site will be restricted from subsurface development, including water well construction. No drilling, excavation, trenching, or digging within the gravel-covered mound area within the fence line, or that exceeds 2 feet below existing grade outside of the mounded area, shall be allowed, without advance approval by USEPA Region VIII.

As part of the Air Force's continuing efforts to verify that the above-mentioned non-liquid PCBs do not pose a significant risk to human health or the environment, five LFs, not including LF B-11, have ongoing long-term groundwater monitoring to allow further evaluation of the potential for impacts from non-liquid PCBs (and related constituents) at all LFs. The results, which to-date have been below action levels, will be used to evaluate the need, if any, for further action at the LFs. LF B-11 was not recommended for long-term monitoring, based on an evaluation of past PCB investigations.

Low concentrations of total PCBs (0.05 ppm) were identified in representative samples of the HICS inner cable components, a short section of which is buried at LF B-11. As a result, the following deed restriction applies:

If HICS cabling is removed (at the landowner's discretion and effort), the covering should not be burned because of the potential to release carbon monoxide from polysulfide components within the inner covering.

Liquid Polychlorinated Biphenyls In Soil (CAS# 11097-69-1). Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. The sump pump outfall soil was sampled between 1998 and 2000 to assess the potential of a liquid PCB release. Concentrations for PCBs ranged from non-detect to 4.1 ppm (well below the USEPA's cleanup action level of 50 ppm) and no remedial action was required.

8.3. Certification Of Asbestos-Containing Material (ACM)

The Real Property on LF B-11 associated with the 446 MS, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

At the LFs, the only item known to contain asbestos was the exhaust system for the diesel electric unit, which was removed as part of site dismantlement. The coatings found on some buried structures (such as the LEB access shaft) at the LFs may contain asbestos. None of the tanks at the LF sites tested positive for asbestos. Any asbestos at the LFs was buried as part of the subsurface structure (disposed of in place, on site). Access to these ACM remnants by future owners is limited by restrictions on subsurface development due to PCBs (see PCB Certification, Section 8.2).

Subject to the above constraints, the property containing the former LF B-11 is safe for human health and the environment.

Certified by: *Randy McCart* October 15, 2005
Randy McCart
Project Manager
LABAT-ANDERSON INCORPORATED
Bellevue, Nebraska
Date

Approved by: _____
Gary T. Maher, GS-15
Chief, Environmental Division
Headquarters U.S. Air Force Space Command
Peterson Air Force Base, Colorado
Date

APPENDIX A -- MAPS AND PHOTOGRAPHS

- Figure B-11-1 Features Surrounding Former Launch Facility B-11
- Figure B-11-2 Site Map of Former Launch Facility B-11
- Figure B-11-3 View of Former Launch Facility B-11 Facing North

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ENVIRONMENTAL BASELINE SURVEY

Relinquishment of Property and Termination of Easements for Launch Facility C-21, 446th Missile Squadron, Minuteman III Intercontinental Ballistic Missile System, Grand Forks Air Force Base, North Dakota

The United States Air Force (USAF) proposes to relinquish its jurisdiction over Launch Facility (LF) C-21 used for the Minuteman (MM) III Intercontinental Ballistic Missile (ICBM) system at Grand Forks Air Force Base (AFB), North Dakota. The LF C-21 is one of 165 land components that made up the missile system. The Air Force will offer the land for sale to the public, and terminate various easements and licenses that were executed to support the MM III system. First priority of consideration is to current adjacent landowners, who must pay fair market value.

This Environmental Baseline Survey (EBS) is in support of the Air Force's proposal to relinquish LF C-21. It accompanies an EBS on the entire 446th Missile Squadron (446 MS). The 446 MS EBS provides general information pertaining to activities and conditions that are common to all missile sites within the MS, including survey methodology, history and current use, and squadron-wide information pertaining to environmental setting, hazardous substances, and environmental investigations and sampling. The 446 MS EBS is incorporated by reference. This LF C-21 EBS provides site-specific information regarding the site description, environmental conditions, sampling results (if applicable), adjacent properties, compliance issues, the category finding, and recommendations. Site-specific figures, contained in Appendix A of this EBS, include: a regional map showing topography, water and wetlands (if present), and other features (Figure C-21-1); a site map also showing relevant topographic features, along with structures and sampling locations (Figure C-21-2); and a photograph taken during the site inspection (Figure C-21-3).

The EBSs were prepared in accordance with Air Force Instruction (AFI) 32-7066, *Environmental Baseline Surveys in Real Estate Transactions* (April 25, 1994), American Standards for Testing Materials (ASTM) publications E 1527-00, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, and E 1528-00, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*.

1. PURPOSE FOR THE ENVIRONMENTAL BASELINE SURVEY

The purpose of this EBS is to identify and document environmental conditions at LF C-21, in order to make decisions in connection with a property transfer.

2. SURVEY METHODOLOGY

A discussion of the general survey methodology (approach, site inspections, personnel interviews, documents reviewed, and other information sources) is provided in the 446 MS EBS. Site-specific sampling results are presented within this EBS.

3. FINDINGS FOR SUBJECT PROPERTY

Site C-21 is located in southwest Pembina County, North Dakota, 3.5 miles north and 1 mile east of the town of Edinburg, and 45 air-miles north-northwest of Grand Forks AFB. Topographically, the site is on an east sloping, glaciated plain near the shoreline of former glacial Lake Agassiz. The plain slopes at approximately 50 feet per mile and is characterized by elongated topographic highs that represent former beaches. Maximum relief within the site area is approximately 7 feet (see Figure C-21-1). Regional drainage is moderately developed and trends south for 1 mile, into the

Middle Park River. The site is on a slight topographic rise that may represent a former beach. The ground surface, which is cultivated, slopes generally to the south at grades of 1 to 4 percent (USGS, 1963a). A gravel pit lies a half mile west of C-21.

3.1. History and Current Use

The history of the site is discussed in the 446 MS EBS. The site contains approximately 10.17 acres. The legal description is found in the real property records at Grand Forks AFB.

A county road borders the site on the south (see Figure C-21-2). The U.S. Air Force boundary extends to the middle of this county road (USACE, 1964). There are no Federal or State Highways adjacent to C-21.

A quantity-distance (safety zone) area for explosive safety extends 1,200 feet out from the launch tube; that circle includes easements of approximately 93.68 acres as well as the Air Force-owned 10.17 acres. Inhabited structures are currently prohibited in the safety zone. Six line of sight azimuth marker easements cover an area of 0.36 acres. An easement for the access road and utilities cover an area of 1.94 acres. The U.S. Air Force has a license from the Gardar Township for the access road approach to the county road. Verification of the boundaries of these easements and their disposition, as well as a more detailed legal description, title documentation, and information on the termination of easements will be found in the Declaration of Excess prepared by the U.S. Air Force and the U.S. Army Corps of Engineers.

3.2. Environmental Setting

3.2.1. Site Inspection Summary

A site inspection was conducted at this LF in October 2000. The site was bordered in all directions by vegetation. Figure C-21-3 shows LF C-21 looking to the north into the site. No erosion was observed on this site. Drainage was positive off site. There was a utility pole located outside of the fenceline on the north. The inside utility pole had been removed. The former antenna field (a pair of antenna wire arrays buried between 4 and 8 feet below the surface) was left in place at dismantlement, and had been plowed but was fallow. There was a hollow metal utility pole lying on the ground outside the fenceline on the north side of the site. There were two empty underground storage tanks (UST) lying in gravel approximately 250 feet and 400 feet from the access road; the USTs were removed and backfilled after the site visit (Vetter, 2003). One tank was approximately 12 feet wide by 25 feet long, and the second was 4 feet wide by 12 feet long. There were three monitoring wells located at this LF. There was a sand and gravel operation located to the north and east of the site.

In September 2005, Grand Forks AFB personnel verified that the sites are still clean, with no spills or dumping (Koop, 2005).

3.2.2. Geology

In 1963, prior to construction of the launch facility, two boreholes were drilled at the site to collect information on stratigraphy and groundwater at the site. One hole was drilled near the location for the launcher tube to a depth of 130 feet. Another hole was drilled near the location of the former launcher equipment building (LEB) to a depth of 65 feet. Glacial overburden extends to the total depth of the borings. The material consists of irregularly alternating units of sand, clay and silt. The sand is dense to very dense, fine to coarse-grained and slightly gravelly. The clay is silty, sandy, and very stiff. The silt is clayey. Bedrock was not encountered in the borings (USAF, 1963).

3.2.3. Soil

This site contained four United States Department of Agriculture (USDA) soil series (Binford sandy loam, Brantford loam, Embden fine sandy loam, and Tiffany fine sandy loam) consisting of various layers of sandy loam, gravelly sand, loam, fine sandy loam, fine sand, fine loamy sand, very fine sand, sand and gravel. These soils have seasonal high water tables ranging from 1.0 feet below the surface to 3.0 feet below the surface, with the exception of the Binford, Embden, and Brantford soils, where the seasonal high water table is greater than five feet. Permeability ranges from moderate to moderate rapid. The rate of water movement in the soil is moderately rapid to rapid. None of these soils experience flooding (USDA, 1977).

3.2.4. Hydrology

The depth to groundwater at C-21 is 16 feet (USAF, 1963). The Middle Branch Park River is 2,000 feet west of C-21. This stream is in the Park River Drainage Basin (USGS hydrologic unit catalog (HUC) 09020310) (USGS, 2001). There are no intermittent lakes located within 1,500 feet or perennial lakes located within one-half mile of C-21.

3.2.5. Wetlands

Federally delineated wetlands under the National Wetland Inventory are located 50 feet east and 440 feet southeast of C-21 (USFWS, 2001). See Figures C-21-1 and C-21-2.

3.3. Hazardous Substances

Hazardous materials were used at the LF for operation of the facility, as well as for maintaining and cleaning the LF (see 446 MS EBS). All hazardous materials stored on the site have been removed. During the inspection in October 2000, no evidence of hazardous waste was present and no spills were observed.

3.4. Installation Restoration Program

LF C-21 was sampled during a site investigation for the 446 MS. Three samples were collected and analyzed for this site at the sump pump outfall, a waterproof coating sample from the access shaft, and a background sample southeast of the LEB (see Figure C-21-2). Soils were sampled for diesel range organics (DRO), gasoline range organics (GRO), priority pollutant metals (PPM), and polychlorinated biphenyls (PCB). All sample results were below regulatory limits (USAF, 1999b). This site is not part of the Grand Forks AFB Installation Restoration Program and no remediation is required.

3.5. Storage Tanks

At LF C-21, an 11,000-gallon deep-buried diesel tank was abandoned in place prior to dismantlement of the facilities. This tank was closed in accordance with state regulations. A 100-gallon diesel fuel tank was removed from the LEB. A shallow-buried 4,000-gallon diesel fuel tank was removed from a location just south of the LEB. All removal and closure activities were coordinated with the North Dakota Department of Health (NDDH). Soil testing conducted at the time of closure did not detect hydrocarbons (USAF, 2000c).

3.6. Oil/Water Separators

There were no oil/water separators at LF C-21.

3.7. Pesticides

Herbicides (Arsenal, Sprakil, Weed Blast, Pramitol, and Bromocil) were used at regular intervals between the early 1960s and the late 1990s to control weed and plant growth at LF C-21. Modeling of herbicide degradation based on application rates of applied formulations indicated that only negligible residues would remain within one year of application (USAF, 1999a). Recent spot treatments have been used sporadically to supplement mowing for noxious weed control. Since these treatments involved smaller treatment areas and lower application rates than the previously modeled applications, they would also be predicted to result in negligible pesticide residues at LF C-21 after one year.

3.8. Medical or Biohazardous Waste

In the event of a physical injury that resulted in generation of medical waste during maintenance activities at the site, all solid waste (including medical waste) generated at the site was gathered and transported for disposal at Grand Forks AFB. There were no biohazardous wastes associated with the LF. Consequently, there is no risk of exposure to medical or biohazardous wastes at the dismantled sites.

3.9. Ordnance

Ballistic gas generators were formerly at the LFs to rapidly open the launcher door in the event of a missile launch. Each LF contained munitions as actuators for the generators, and ordnance was associated with the MM missile components. A 1,200-foot quantity distance arc (safety zone) was established for explosive safety at each LF to preclude any inhabited structures within this zone. No detonations during handling of any ordnance occurred at the Grand Forks AFB deployment area (Rudolf, 1997). The ballistic gas generators and missiles were removed during the deactivation process. No explosives or ordnance remain at the LF.

3.10. Radioactive Waste

Radioactive waste is discussed in the 446 MS EBS. No leaks of radioactive materials are known to have occurred at Grand Forks AFB or in the deployment area (Rudolf, 1998). There is no risk of radiation exposure caused by past use of this site.

3.11. Solid Waste

Solid waste generated at LF C-21 during maintenance activities was collected and returned to Grand Forks AFB for proper disposal. During dismantlement activities, any solid wastes generated (except construction rubble) were collected and disposed off-site by a government contractor. Construction rubble was placed down the launch tube during dismantlement, and the launch tube was subsequently sealed with concrete to limit access to the subsurface. Although the site may qualify as an inert solid waste landfill under *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01, a permit was not needed because all construction rubble placed in the launch tube was generated on Air Force property. All appropriate design criteria (including a geo-textile membrane at a depth of about 8 feet and appropriate fill) were followed for a permit-exempt inert solid waste landfill according to the *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01. There are no other solid waste disposal sites at LF C-21.

3.12. Groundwater

There were PCBs in coatings on the access and ventilation shafts, and possibly on the deep-buried 11,000-gallon UST that was closed in place at LF C-21. Groundwater monitoring at selected LFs

(including LF C-21) is currently underway because of the possibility that PCBs from these coatings may leach into shallow groundwater (see Section 3.16 and the 446 MS EBS).

3.13. Wastewater Treatment, Collection, and Discharge

No wastewater treatment, collection, or discharge was associated with the LF.

3.14. Drinking Water Quality

No potable water access was developed at any LF. In accordance with a groundwater monitoring plan for the missile deployment area that was developed by Grand Forks AFB and approved by the United States Environmental Protection Agency (USEPA) Region 8, no shallow drinking water wells can be installed at LF C-21 for at least 50 years (see Section 3.12).

3.15. Asbestos

The diesel electric unit (DEU) exhaust systems in the LEB contained asbestos insulation under a metal sheet covering. The DEU was removed from the site during dismantlement activities. None of the USTs at the LF tested positive for asbestos (Vetter, 2001). Some of the buried structures at the LF, such as the LEB access shaft, could contain asbestos. Any asbestos at the LFs was buried as part of the subsurface structure.

3.16. Polychlorinated Biphenyls

All equipment (e.g., electric filters, panels, capacitors, and light ballasts) that potentially contained PCBs was removed during the environmental safing process of the LF deactivation. However, the 11,000-gallon deep-buried UST closed in place at C-21 may have a PCB coating. All other buried structures may also be covered with a PCB coating (Vetter, 2001).

Samples for analyzing PCBs were collected at selected LFs from waterproof coatings on ventilation and access shafts and from adjacent soils. Samples taken from sump pump outfalls at all LFs were also analyzed for PCBs. The concentrations detected were all below action criteria levels. A more complete discussion of in-situ PCB disposal and sampling is included in the EBS for the 446 MS Sites.

3.17. Radon

Radon is generally a concern only for occupied dwellings. Therefore, no radon monitoring was conducted at the site (Rudolf, 2001).

3.18. Lead-based Paint

Lead-based paint (LBP) may have been used on interior and exterior surfaces in buildings constructed prior to 1978. At the LF, the interior of the launcher and LEB contained LBP. Although the lead content of the particular paint used is unknown, the paint used at the LF sites is conservatively assumed to contain 20 percent lead by weight. Subsurface structures potentially coated with LBP were buried in place. During Rivet Minuteman Integrated Life Extension (MILE) activities, underground structures were brought to the surface for maintenance, and portions of the original paint were chipped off and left on the topside ground surface of each site (Hustad, 1998). A soil sample for lead collected at the sump pump outfall indicated 3.7 ppm, and a background soil sample southeast of the LEB indicated 7.9 ppm (USAF, 1999b). Sampling points are shown on Figure C-21-2. Although a standard has not been established for rural areas, these values are well below the residential standard of 1,200 ppm. The LF structures did not meet the definition of target housing for LBP regulation.

The paint may also have contained other heavy metals, such as cadmium, chromium and mercury, and soil samples were analyzed for these metals as well. Readings for the sump pump and background samples were 5.3 and 6.4 ppm for chromium respectively and non-detect for cadmium and mercury. Regulatory limits have not been established for soil contamination for these metals.

4. FINDINGS FOR ADJACENT PROPERTIES

The site is surrounded by agricultural areas used for crop production. There are no National Priority List sites in North Dakota. No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), treatment, storage, and/or disposal (TSD), or Emergency Response Notification System (ERNS) sites are located within search distances, as defined by ASTM Standards (NRC, 2005; NDDH, 2002; NDDH, 2005; USEPA, 2005a; USEPA, 2005b; USEPA, 2005c; USEPA, 2005d).

5. APPLICABLE REGULATORY COMPLIANCE ISSUES

Compliance issues are environmental conditions that may affect the transfer or use of the subject property. These conditions include historic property, prehistoric sites, traditional cultural resources, sensitive habitats, threatened or endangered species, wetlands, floodplains, seismic conditions, mineral resources, prime and unique farmlands or timberlands, and water rights. There are no prehistoric or traditional cultural resources at the site.

5.1. Historic Property

The State Historical Society of North Dakota (SHSND) and the Advisory Council were consulted as part of the Environmental Impact Statement for the Minuteman III Dismantlement (USAF, 1999a). LF C-21 was considered eligible for listing in the National Register of Historic Places. However, the U.S. Air Force and the SHSND have negotiated a Programmatic Agreement to retain a Missile Alert Facility (MAF) (O-0) and LF (N-33) in the 448 MS. No restrictions for transfer of the property at LF C-21 are required.

5.2. Sensitive Habitats

LF C-21 is not adjacent to or within any protected areas, such as national wildlife refuges, national or state wildlife management areas, or waterfowl protection areas. No disturbance to protected habitats would likely occur if the land is sold; therefore, no restrictions for the transfer of the property are required.

5.3. Threatened and Endangered Species

No known threatened or endangered plant or animal species, or suitable habitat for such species, occur within the LF (USAF, 1999a). No impacts to any protected species or their habitat should occur if the property is sold; therefore, no restrictions are required.

5.4. Wetlands

The National Wetland Inventory has identified wetlands within 1,500 feet of the Air Force property boundary (see Section 3.5.4 and Appendix A). Although it is unlikely that a future owner of this site would disturb these wetlands, they may be subject to the *Clean Water Act*. No disturbance would result from the actual transfer of property.

5.5. Floodplains

LF C-21 is not within an area designated as a 100-year floodplain (USAF, 1999a). No impacts to any type of floodplain would occur if the property is sold; therefore, no restrictions are required.

5.6. Seismic Conditions

LF C-21 is situated in Seismic Hazard Zone 0. Seismic conditions are not a concern in the vicinity of the LF; therefore, no restrictions are required.

5.7. Mineral Resources

No economically recoverable mineral resources have been identified in the vicinity of the LF; therefore, no restrictions are required.

5.8. Prime and Unique Farmlands or Timberlands

Part of this property is within prime and unique farmlands, but no timberlands have been designated in the vicinity of the LF. The Tiffany and Embedden series are found on the western half of the property. The portion of this site designated as prime farmland is subject to the *Farmland Protection Policy Act* (Public Law 97-98).

5.9. Water Rights

If any water rights were acquired, they will be addressed in the Report of Excess to be prepared for each site by the U.S. Air Force and the U.S. Army Corps of Engineers (Noordam, 2001).

6. CONCLUSIONS

The following finding is based on a site inspection of the LF C-21 and a review of the EBS. The LF has been designated as:

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require removal or remedial response.

No data gaps have been identified.

7. RECOMMENDATIONS

The findings of this EBS indicate minimal potential for environmental contamination at LF C-21. Therefore, it is recommended that the Air Force pursue the sale of the LF C-21 property associated with the 446 MS of the former Minuteman III Missile System at Grand Forks AFB, ND.

Due to the presence of PCBs in coatings used on certain structures, there is a potential for low levels of PCB contamination in groundwater, and monitoring is underway (see the 446 MS EBS). Consequently, there is a restriction on excavating to a depth greater than 2 feet (within the fenceline), disturbing the gravel mound at the site of the former launch tube, or drilling to supply drinking water, and this restriction should be disclosed to potential purchasers.

Various structures were left buried on the property (within and outside of the fence). An antenna field is buried about 4 feet below the surface (Klaus, 2003) to the south and southwest of the fenceline. A hardened intersite cable and associated junction boxes, connected to the MAF, are also buried about 4 feet below the surface. Line of sight markers are buried to a depth of 8 feet. Any of these buried structures could potentially be encountered while plowing fields on this property.

The portion of this land designated as prime farmland (discussed in Section 5.8) is subject to the *Farmland Protection Policy Act* (Public Law 97-98). Restrictions would apply to the conversion of the land to a non-agricultural use.

8. CERTIFICATIONS

A search of Air Force files has revealed that hazardous substances, as that term is defined by the Air Force and in CERCLA, as amended, were used or stored for one year or more, known to have been released, or were disposed of on LF C-21, associated with the 446 MS, Grand Forks AFB, ND, as described below. Section 8.1 addresses hazardous substances; PCBs and asbestos-containing materials (ACM) are addressed separately in Sections 8.2 and 8.3, respectively.

8.1. Hazardous Substances

The following notice provides the available information discovered as a result of a search of Air Force files pertaining to hazardous substances known to have been stored, released, or disposed of at the Site:

- **Petroleum Constituents.** Petroleum-containing materials were used at LF C-21 from approximately 1964 to 1998. In 1998 VOC and TPH concentrations of surficial soil at the sump pump outfall were non-detectable. The petroleum diesel UST was closed in-place in 1999. Closure documentation was submitted to NDDH, who responded that the closure reports were satisfactory and that no further action will be required (NDDH, 2004).
- **Lead-Based Paint (LBP).** LBP was identified in the sodium chromate coolant tank coating; the tank was removed and disposed off-site as hazardous waste. LBP was assumed to exist in the launcher rubble, which was tested at selected LFs for toxicity characteristic leaching procedure (TCLP) lead; all concentrations were less than the action limit.
- **Priority Pollutant List Metals (PPL).** Soil samples for PPL metals (silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc) were collected at the sump pump outfall at all LFs, and randomly at other locations at LFs. All samples that indicated the presence of metals were consistent with local background concentrations and/or were less than levels that required action by the USEPA or NDDH.
- **Chromium (CAS# 7440-47-3).** An unquantified amount of chromium may have been contained in LBP used as coatings for underground structures, and if present is buried in the launch tube rubble; sampling results were below action levels.
- **Sodium Chromate (CAS# 7775-11-3).** About 88 pounds of sodium chromate coolant solution was stored or used at LF C-21 from approximately 1964 to 1998. All fluid and associated equipment was removed from the site by 1998 during the environmental safing process.
- **Miscellaneous.** Limited amounts of hydraulic fluid, lead, mercury, cadmium, pesticides, solvents, coolants, paints, ordnance, and lead acid batteries were used and/or stored at LF C-21. All materials were removed during deactivation, and no releases other than those deemed *de minimis* were identified. No concentrations of these and/or related constituents above their respective action levels were identified during environmental testing.

The Air Force has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substances released, disposed of, or stored at LF C-21, which is identified as excess to U.S. Air Force requirements and proposed for disposal.

8.2. Certification Of Polychlorinated Biphenyls (PCB)

The Real Property at LF C-21 associated with the former 446 MS, Grand Forks AFB, ND, is subject to restrictions due to PCBs as outlined below:

Non-liquid Polychlorinated Biphenyls (CAS# 1336-36-3). Non-liquid PCBs were used in waterproofing materials during construction at the Site beginning in 1964. Non-liquid PCBs are assumed to still be present in waterproofing materials at the LF based on representative sampling. Testing in 1997 revealed a PCB coating on some tanks at MAFs; a shallow buried tanks were removed from the site. The waterproof coating on one deep buried tank was tested for PCBs and none were detected. These tanks were closed in place. Soils adjacent to the removed tanks had PCB concentrations ranging from non-detect to 14 ppm. The total PCB concentrations for waterproofing at LFs (sampled at ventilation shafts and access shafts) ranged from non-detect to 38,000 ppm. All TCLP-PCB concentrations were less than 10 ppb (ranging from non-detect to 6 ppb). The UST was closed in place and most of the piping and conduit was disposed as *Toxic Substance Control Act*-PCB waste, and a limited amount of piping and conduit remains buried at the site.

The Air Force also conducted testing for non-liquid PCBs in soil at all LFs in support of the 2001 Groundwater Monitoring Plans (GWMP) (USAF, 2000e, 2001c). The GWMP concluded that the type of PCB material in the UST and rubble coatings has a low potential to leach into or impact environmental media, and it therefore constitutes an unlikely source of significant risk to human health or the environment. Nevertheless, due to PCB-containing coating material that may exist on buried rubble, piping and conduit, and intact support building and launcher (silo) coatings, the following deed restrictions apply to LF C-21, as established in cooperation with the USEPA, Region VIII:

Any future private owners of the Site will be restricted from subsurface development, including water well construction. No drilling, excavation, trenching, or digging within the gravel-covered mound area within the fence line, or that exceeds 2 feet below existing grade outside of the mounded area, shall be allowed, without advance approval by USEPA Region VIII.

As part of the Air Force's continuing efforts to verify that the above-mentioned non-liquid PCBs do not pose a significant risk to human health or the environment, five LFs, including LF C-21, have ongoing long-term groundwater monitoring to allow further evaluation of the potential for impacts from non-liquid PCBs (and related constituents) at all LFs. The results, which to-date have been below action levels, will be used to evaluate the need, if any, for further action at the LFs. LF C-21 was recommended for long-term monitoring, based on an evaluation of past PCB investigations.

Low concentrations of total PCBs (0.05 ppm) were identified in representative samples of the HICS inner cable components, a short section of which is buried at LF C-21. As a result, the following deed restriction applies:

If HICS cabling is removed (at the landowner's discretion and effort), the covering should not be burned because of the potential to release carbon monoxide from polysulfide components within the inner covering.

Liquid Polychlorinated Biphenyls In Soil (CAS# 11097-69-1). Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. The sump pump outfall soil was sampled between 1998 and 2000 to assess the potential of a liquid PCB release. Concentrations for PCBs ranged from non-detect to 4.1 ppm (well below the USEPA's cleanup action level of 50 ppm) and no remedial action was required.

8.3. Certification Of Asbestos-Containing Material (ACM)

The Real Property on LF C-21 associated with the 446 MS, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

At the LFs, the only item known to contain asbestos was the exhaust system for the diesel electric unit, which was removed as part of site dismantlement. The coatings found on some buried structures (such as the LEB access shaft) at the LFs may contain asbestos. None of the tanks at the LF sites tested positive for asbestos. Any asbestos at the LFs was buried as part of the subsurface structure (disposed of in place, on site). Access to these ACM remnants by future owners is limited by restrictions on subsurface development due to PCBs (see PCB Certification, Section 8.2).

Subject to the above constraints, the property containing the former LF C-21 is safe for human health and the environment.

Certified by: *Randy McCart* October 15, 2005
Randy McCart
Project Manager
LABAT-ANDERSON INCORPORATED
Bellevue, Nebraska
Date

Approved by: _____
Gary T. Maher, GS-15
Chief, Environmental Division
Headquarters U.S. Air Force Space Command
Peterson Air Force Base, Colorado
Date

APPENDIX A -- MAPS AND PHOTOGRAPHS

- | | |
|---------------|--|
| Figure C-21-1 | Features Surrounding Former Launch Facility C-21 |
| Figure C-21-2 | Site Map of Former Launch Facility C-21 |
| Figure C-21-3 | View of Former Launch Facility C-21 Facing North |

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ENVIRONMENTAL BASELINE SURVEY

Relinquishment of Property and Termination of Easements for Launch Facility C-23, 446th Missile Squadron, Minuteman III Intercontinental Ballistic Missile System, Grand Forks Air Force Base, North Dakota

The United States Air Force (USAF) proposes to relinquish its jurisdiction over Launch Facility (LF) C-23 used for the Minuteman (MM) III Intercontinental Ballistic Missile (ICBM) system at Grand Forks Air Force Base (AFB), North Dakota. The LF C-23 is one of 165 land components that made up the missile system. The Air Force will offer the land for sale to the public, and terminate various easements and licenses that were executed to support the MM III system. First priority of consideration is to current adjacent landowners, who must pay fair market value.

This Environmental Baseline Survey (EBS) is in support of the Air Force's proposal to relinquish LF C-23. It accompanies an EBS on the entire 446th Missile Squadron (446 MS). The 446 MS EBS provides general information pertaining to activities and conditions that are common to all missile sites within the MS, including survey methodology, history and current use, and squadron-wide information pertaining to environmental setting, hazardous substances, and environmental investigations and sampling. The 446 MS EBS is incorporated by reference. This LF C-23 EBS provides site-specific information regarding the site description, environmental conditions, sampling results (if applicable), adjacent properties, compliance issues, the category finding, and recommendations. Site-specific figures, contained in Appendix A of this EBS, include: a regional map showing topography, water and wetlands (if present), and other features (Figure C-23-1); a site map also showing relevant topographic features, along with structures and sampling locations (Figure C-23-2); and photographs taken during the site inspection (Figure C-23-3 and following).

The EBSs were prepared in accordance with Air Force Instruction (AFI) 32-7066, *Environmental Baseline Surveys in Real Estate Transactions* (April 25, 1994), American Standards for Testing Materials (ASTM) publications E 1527-00, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, and E 1528-00, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*.

1. PURPOSE FOR THE ENVIRONMENTAL BASELINE SURVEY

The purpose of this EBS is to identify and document environmental conditions at LF C-23, in order to make decisions in connection with a property transfer.

2. SURVEY METHODOLOGY

A discussion of the general survey methodology (approach, site inspections, personnel interviews, documents reviewed, and other information sources) is provided in the 446 MS EBS. Site-specific sampling results are presented within this EBS.

3. FINDINGS FOR SUBJECT PROPERTY

Site C-23 is located in central Walsh County, North Dakota, 2 miles north of the town of Park River and 35 air-miles north-northwest of Grand Forks AFB. Topographically, the site is on a gently rolling, glacial till plain in the Red River Valley. The plain slopes regionally eastward at approximately 50 feet per mile. Surface slopes average 1 percent to the east and maximum relief within the site area is approximately 8 feet (see Figure C-23-1). Regional drainage is moderately developed south of the site area by the east-trending, south branch of the Park River. The site is on a

very slight, north-trending, topographic rise in a cultivated field (USGS, 1963b). There are no mines or quarries within a mile of C-23.

3.1. History and Current Use

The history of the site is discussed in the 446 MS EBS. The site contains approximately 10.17 acres. The legal description is found in the real property records at Grand Forks AFB.

A county road borders the site on the east (see Figure C-23-2). The U.S. Air Force boundary extends to the middle of this county road (USACE, 1964). There are no Federal or State Highways adjacent to C-23.

A quantity-distance (safety zone) area for explosive safety extends 1,200 feet out from the launch tube; that circle includes easements of approximately 93.68 acres as well as the Air Force-owned 10.17 acres. Inhabited structures are currently prohibited in the safety zone. Line of sight azimuth marker easements cover areas of 0.04, 0.13, and 0.19 acres. An easement for the access road and utilities cover an area of 1.19 acres. The U.S. Air Force has a license from Walsh County for the access road approach to the county road. Verification of the boundaries of these easements and their disposition, as well as a more detailed legal description, title documentation, and information on the termination of easements will be found in the Declaration of Excess prepared by the U.S. Air Force and the U.S. Army Corps of Engineers.

3.2. Environmental Setting

3.2.1. Site Inspection Summary

A site inspection was conducted at this LF in June 2001. The site was bordered in all directions by agricultural fields, which had a 25 foot corridor of grassland. Figure C-23-3 shows LF C-23 looking to the west into the site. Drainage was onto site, without off site drainage. Two minor diesel spills, both one foot in diameter, were located 20 feet inside the gate. The grading was in progress, but no gravel had been spread. There was a utility pole located outside the fenceline to the north. The former antenna field (a pair of antenna wire arrays buried between 4 and 8 feet below the surface) was left in place at dismantlement, and crops have been planted at the surface. The soil in the south and southwest corner were bare. There were rubber strips (e.g. silt barrier) scattered throughout the site. Both diesel spills were cleaned, grading was completed, and various debris (silt barrier) was removed after the site visit (Vetter, 2003).

In September 2005, Grand Forks AFB personnel verified that the sites are still clean, with no spills or dumping (Koop, 2005).

3.2.2. Geology

In 1963, prior to construction of the launch facility, two boreholes were drilled at the site to collect information on stratigraphy and groundwater at the site. One hole was drilled near the location for the launcher tube to a depth of 130 feet. Another hole was drilled near the location of the former launcher equipment building (LEB) to a depth of 65 feet. Glacial overburden extends to the total depth of the borings. The material consists of irregularly alternating units of sand, clay, and silt that averages 5 to 10 feet in thickness. The clay is generally silty; the sand is silty and fine to medium-grained and the silt is clayey. Bedrock was not encountered in the borings (USAF, 1963).

3.2.3. Soil

This site contains one United States Department of Agriculture (USDA) soil series (Gilby loams) consisting of various layers of loam, and clay loam. These soils have seasonal high water tables ranging from 1.0 foot below the surface to 4.0 feet below the surface from April through June.

Permeability ranges from slow to moderate. The rate of water movement in the soil is slow to moderate. None of these soils experience flooding (USDA, 1972).

3.2.4. Hydrology

The depth to groundwater at C-23 is 12 feet (USAF, 1963). An intermittent branch of the South Branch Park River lies 410 feet south of C-23. This stream is in the Park River Drainage Basin (USGS hydrologic unit catalog (HUC) 09020310) (USGS, 2001). There are no intermittent lakes located within 1,500 feet or perennial lakes located within one-half mile of C-23.

3.2.5. Wetlands

There are no federally delineated wetlands under the National Wetland Inventory within 1,000 feet of C-23.

3.3. Hazardous Substances

Hazardous materials were used at the LF for operation of the facility, as well as for maintaining and cleaning the LF (see 446 MS EBS). All hazardous materials stored on the site have been removed. During the inspection in June 2001, no evidence of hazardous waste was present and no spills were observed.

3.4. Installation Restoration Program

LF C-23 was sampled during a site investigation for the 446 MS. Two samples were collected and analyzed for this site at the sump pump outfall, and a waterproof coating sample from the access shaft (see Figure C-23-2). Soils were sampled for diesel range organics (DRO), gasoline range organics (GRO), priority pollutant metals (PPM), and polychlorinated biphenyls (PCB). All sample results were below regulatory limits, except DRO at 100 ppm (USAF, 1999b). This site is not part of the Grand Forks AFB Installation Restoration Program and no remediation is required.

3.5. Storage Tanks

At LF C-23, an 11,000-gallon deep-buried diesel tank was abandoned in place prior to dismantlement of the facilities. This tank was closed in accordance with state regulations. A 100-gallon diesel fuel tank was removed from the LEB. A shallow-buried 4,000-gallon diesel fuel tank was removed from a location just south of the LEB. All removal and closure activities were coordinated with the North Dakota Department of Health (NDDH). Soil testing conducted at the time of closure did not detect hydrocarbons (USAF, 2000c).

3.6. Oil/Water Separators

There were no oil/water separators at LF C-23.

3.7. Pesticides

Herbicides (Arsenal, Sprakil, Weed Blast, Pramitol, and Bromocil) were used at regular intervals between the early 1960s and the late 1990s to control weed and plant growth at LF C-23. Modeling of herbicide degradation based on application rates of applied formulations indicated that only negligible residues would remain within one year of application (USAF, 1999a). Recent spot treatments have been used sporadically to supplement mowing for noxious weed control. Since these treatments involved smaller treatment areas and lower application rates than the previously modeled applications, they would also be predicted to result in negligible pesticide residues at LF C-23 after one year.

3.8. Medical or Biohazardous Waste

In the event of a physical injury that resulted in generation of medical waste during maintenance activities at the site, all solid waste (including medical waste) generated at the site was gathered and transported for disposal at Grand Forks AFB. There were no biohazardous wastes associated with the LF. Consequently, there is no risk of exposure to medical or biohazardous wastes at the dismantled sites.

3.9. Ordnance

Ballistic gas generators were formerly at the LFs to rapidly open the launcher door in the event of a missile launch. Each LF contained munitions as actuators for the generators, and ordnance was associated with the MM missile components. A 1,200-foot quantity distance arc (safety zone) was established for explosive safety at each LF to preclude any inhabited structures within this zone. No detonations during handling of any ordnance occurred at the Grand Forks AFB deployment area (Rudolf, 1997). The ballistic gas generators and missiles were removed during the deactivation process. No explosives or ordnance remain at the LF.

3.10. Radioactive Waste

Radioactive waste is discussed in the 446 MS EBS. No leaks of radioactive materials are known to have occurred at Grand Forks AFB or in the deployment area (Rudolf, 1998). There is no risk of radiation exposure caused by past use of this site.

3.11. Solid Waste

Solid waste generated at LF C-23 during maintenance activities was collected and returned to Grand Forks AFB for proper disposal. During dismantlement activities, any solid wastes generated (except construction rubble) were collected and disposed off-site by a government contractor. Construction rubble was placed down the launch tube during dismantlement, and the launch tube was subsequently sealed with concrete to limit access to the subsurface. Although the site may qualify as an inert solid waste landfill under *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01, a permit was not needed because all construction rubble placed in the launch tube was generated on Air Force property. All appropriate design criteria (including a geo-textile membrane at a depth of about 8 feet and appropriate fill) were followed for a permit-exempt inert solid waste landfill according to the *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01. There are no other solid waste disposal sites at LF C-23.

3.12. Groundwater

There were PCBs in coatings on the access and ventilation shafts, and possibly on the deep-buried 11,000-gallon underground storage tank (UST) that was closed in place at LF C-23. Groundwater monitoring at selected LFs is currently underway because of the possibility that PCBs from these coatings may leach into shallow groundwater (see Section 3.16 and the 446 MS EBS).

3.13. Wastewater Treatment, Collection, and Discharge

No wastewater treatment, collection, or discharge was associated with the LF.

3.14. Drinking Water Quality

No potable water access was developed at any LF. In accordance with a groundwater monitoring plan for the missile deployment area that was developed by Grand Forks AFB and approved by the United States Environmental Protection Agency (USEPA) Region 8, no shallow drinking water wells can be installed at LF C-23 for at least 50 years (see Section 3.12).

3.15. Asbestos

The diesel electric unit (DEU) exhaust systems in the LEB contained asbestos insulation under a metal sheet covering. The DEU was removed from the site during dismantlement activities. None of the USTs at the LF tested positive for asbestos (Vetter, 2001). Some of the buried structures at the LF, such as the LEB access shaft, could contain asbestos. Any asbestos at the LFs was buried as part of the subsurface structure.

3.16. Polychlorinated Biphenyls

All equipment (e.g., electric filters, panels, capacitors, and light ballasts) that potentially contained PCBs was removed during the environmental safing process of the LF deactivation. However, the 11,000-gallon deep-buried UST closed in place at C-23 may have a PCB coating. All other buried structures may also be covered with a PCB coating (Vetter, 2001).

Samples for analyzing PCBs were collected at selected LFs from waterproof coatings on ventilation and access shafts and from adjacent soils. Samples taken from sump pump outfalls at all LFs were also analyzed for PCBs. The concentrations detected were all below action criteria levels. A more complete discussion of in-situ PCB disposal and sampling is included in the EBS for the 446 MS Sites.

3.17. Radon

Radon is generally a concern only for occupied dwellings. Therefore, no radon monitoring was conducted at the site (Rudolf, 2001).

3.18. Lead-based Paint

Lead-based paint (LBP) may have been used on interior and exterior surfaces in buildings constructed prior to 1978. At the LF, the interior of the launcher and LEB contained LBP. Although the lead content of the particular paint used is unknown, the paint used at the LF sites is conservatively assumed to contain 20 percent lead by weight. Subsurface structures potentially coated with LBP were buried in place. During Rivet Minuteman Integrated Life Extension (MILE) activities, underground structures were brought to the surface for maintenance, and portions of the original paint were chipped off and left on the topside ground surface of each site (Hustad, 1998). A soil sample for lead collected at the sump pump outfall indicated 7.0 ppm (USAF, 1999b). Sampling points are shown on Figure C-23-2. Although a standard has not been established for rural areas, these values are well below the residential standard of 1,200 ppm. The LF structures did not meet the definition of target housing for LBP regulation.

The paint may also have contained other heavy metals, such as cadmium, chromium and mercury, and soil samples were analyzed for these metals as well. Readings were 6.8 ppm for chromium and non-detect for cadmium and mercury. Regulatory limits have not been established for soil contamination for these metals.

4. FINDINGS FOR ADJACENT PROPERTIES

The site is surrounded by agricultural areas used for crop production. There are no National Priority List sites in North Dakota. No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), treatment, storage, and/or disposal (TSD), or Emergency Response Notification System (ERNS) sites are located within search distances, as defined by ASTM Standards (NRC, 2005; NDDH, 2002; NDDH, 2005; USEPA, 2005a; USEPA, 2005b; USEPA, 2005c; USEPA, 2005d).

5. APPLICABLE REGULATORY COMPLIANCE ISSUES

Compliance issues are environmental conditions that may affect the transfer or use of the subject property. These conditions include historic property, prehistoric sites, traditional cultural resources, sensitive habitats, threatened or endangered species, wetlands, floodplains, seismic conditions, mineral resources, prime and unique farmlands or timberlands, and water rights. There are no prehistoric or traditional cultural resources at the site.

5.1. Historic Property

The State Historical Society of North Dakota (SHSND) and the Advisory Council were consulted as part of the Environmental Impact Statement for the Minuteman III Dismantlement (USAF, 1999a). LF C-23 was considered eligible for listing in the National Register of Historic Places. However, the U.S. Air Force and the SHSND have negotiated a Programmatic Agreement to retain a Missile Alert Facility (MAF) (O-0) and LF (N-33) in the 448 MS. No restrictions for transfer of the property at LF C-23 are required.

5.2. Sensitive Habitats

LF C-23 is not adjacent to or within any protected areas, such as national wildlife refuges, national or state wildlife management areas, or waterfowl protection areas. No disturbance to protected habitats would likely occur if the land is sold; therefore, no restrictions for the transfer of the property are required.

5.3. Threatened and Endangered Species

No known threatened or endangered plant or animal species, or suitable habitat for such species, occur within the LF (USAF, 1999a). No impacts to any protected species or their habitat should occur if the property is sold; therefore, no restrictions are required.

5.4. Wetlands

There are no nearby wetlands, according to the National Wetlands Inventory. There would be no impacts to wetlands from the transfer of property.

5.5. Floodplains

LF C-23 is not within an area designated as a 100-year floodplain (USAF, 1999a). No impacts to any type of floodplain would occur if the property is sold; therefore, no restrictions are required.

5.6. Seismic Conditions

LF C-23 is situated in Seismic Hazard Zone 0. Seismic conditions are not a concern in the vicinity of the LF; therefore, no restrictions are required.

5.7. Mineral Resources

No economically recoverable mineral resources have been identified in the vicinity of the LF; therefore, no restrictions are required.

5.8. Prime and Unique Farmlands or Timberlands

The property is within prime and unique farmlands, but no timberlands have been designated in the vicinity of the LF. This site is subject to the *Farmland Protection Policy Act* (Public Law 97-98).

5.9. Water Rights

If any water rights were acquired, they will be addressed in the Report of Excess to be prepared for each site by the U.S. Air Force and the U.S. Army Corps of Engineers (Noordam, 2001).

6. CONCLUSIONS

The following finding is based on a site inspection of the LF C-23 and a review of the EBS. The LF has been designated as:

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require removal or remedial response.

No data gaps have been identified.

7. RECOMMENDATIONS

The findings of this EBS indicate minimal potential for environmental contamination at LF C-23. Therefore, it is recommended that the Air Force pursue the sale of the LF C-23 property associated with the 446 MS of the former Minuteman III Missile System at Grand Forks AFB, ND.

Due to the presence of PCBs in coatings used on certain structures, there is a potential for low levels of PCB contamination in groundwater, and monitoring is underway (see the 446 MS EBS). Consequently, there is a restriction on excavating to a depth greater than 2 feet (within the fenceline), disturbing the gravel mound at the site of the former launch tube, or drilling to supply drinking water, and this restriction should be disclosed to potential purchasers.

Various structures were left buried on the property (within and outside of the fence). An antenna field is buried about 4 feet below the surface (Klaus, 2003) to the south and southwest of the fenceline. A hardened intersite cable and associated junction boxes, connected to the MAF, are also buried about 4 feet below the surface. Line of sight markers are buried to a depth of 8 feet. Any of these buried structures could potentially be encountered while plowing fields on this property.

The portion of this land designated as prime farmland (discussed in Section 5.8) is subject to the *Farmland Protection Policy Act* (Public Law 97-98). Restrictions would apply to the conversion of the land to a non-agricultural use.

8. CERTIFICATIONS

A search of Air Force files has revealed that hazardous substances, as that term is defined by the Air Force and in CERCLA, as amended, were used or stored for one year or more, known to have been released, or were disposed of on LF C-23, associated with the 446 MS, Grand Forks AFB, ND, as described below. Section 8.1 addresses hazardous substances; PCBs and asbestos-containing materials (ACM) are addressed separately in Sections 8.2 and 8.3, respectively.

8.1. Hazardous Substances

The following notice provides the available information discovered as a result of a search of Air Force files pertaining to hazardous substances known to have been stored, released, or disposed of at the Site:

- **Petroleum Constituents.** Petroleum-containing materials were used at LF C-23 from approximately 1964 to 1998. In 1998 VOC and TPH concentrations of surficial soil at the sump pump outfall were non-detectable. The petroleum diesel UST was closed in-place in 2000. Closure documentation was submitted to NDDH, who responded that the closure reports were satisfactory and that no further action will be required (NDDH, 2004).

- **Lead-Based Paint (LBP).** LBP was identified in the sodium chromate coolant tank coating; the tank was removed and disposed off-site as hazardous waste. LBP was assumed to exist in the launcher rubble, which was tested at selected LFs for toxicity characteristic leaching procedure (TCLP) lead; all concentrations were less than the action limit.
- **Priority Pollutant List Metals (PPL).** Soil samples for PPL metals (silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc) were collected at the sump pump outfall at all LFs, and randomly at other locations at LFs. All samples that indicated the presence of metals were consistent with local background concentrations and/or were less than levels that required action by the USEPA or NDDH.
- **Chromium (CAS# 7440-47-3).** An unquantified amount of chromium may have been contained in LBP used as coatings for underground structures, and if present is buried in the launch tube rubble; sampling results were below action levels.
- **Sodium Chromate (CAS# 7775-11-3).** About 88 pounds of sodium chromate coolant solution was stored or used at LF C-23 from approximately 1964 to 1998. All fluid and associated equipment was removed from the site by 1998 during the environmental safing process.
- **Miscellaneous.** Limited amounts of hydraulic fluid, lead, mercury, cadmium, pesticides, solvents, coolants, paints, ordnance, and lead acid batteries were used and/or stored at LF C-23. All materials were removed during deactivation, and no releases other than those deemed *de minimis* were identified. No concentrations of these and/or related constituents above their respective action levels were identified during environmental testing.

The Air Force has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substances released, disposed of, or stored at LF C-23, which is identified as excess to U.S. Air Force requirements and proposed for disposal.

8.2. Certification Of Polychlorinated Biphenyls (PCB)

The Real Property at LF C-23 associated with the former 446 MS, Grand Forks AFB, ND, is subject to restrictions due to PCBs as outlined below:

Non-liquid Polychlorinated Biphenyls (CAS# 1336-36-3). Non-liquid PCBs were used in waterproofing materials during construction at the Site beginning in 1964. Non-liquid PCBs are assumed to still be present in waterproofing materials at the LF based on representative sampling. Testing in 1997 revealed a PCB coating on some tanks at MAFs; a shallow buried tanks were removed from the site. The waterproof coating on one deep buried tank was tested for PCBs and none were detected. These tanks were closed in place. Soils adjacent to the removed tanks had PCB concentrations ranging from non-detect to 14 ppm. The total PCB concentrations for waterproofing at LFs (sampled at ventilation shafts and access shafts) ranged from non-detect to 38,000 ppm. All TCLP-PCB concentrations were less than 10 ppb (ranging from non-detect to 6 ppb). The UST was closed in place and most of the piping and conduit was disposed as *Toxic Substance Control Act*-PCB waste, and a limited amount of piping and conduit remains buried at the site.

The Air Force also conducted testing for non-liquid PCBs in soil at all LFs in support of the 2001 Groundwater Monitoring Plans (GWMP) (USAF, 2000e, 2001c). The GWMP concluded that the type of PCB material in the UST and rubble coatings has a low potential to leach into or impact environmental media, and it therefore constitutes an unlikely source of significant risk to human health or the environment. Nevertheless, due to PCB-containing coating material that may exist on buried rubble, piping and conduit, and intact support building and launcher (silo) coatings, the

following deed restrictions apply to LF C-23, as established in cooperation with the USEPA, Region VIII:

Any future private owners of the Site will be restricted from subsurface development, including water well construction. No drilling, excavation, trenching, or digging within the gravel-covered mound area within the fence line, or that exceeds 2 feet below existing grade outside of the mounded area, shall be allowed, without advance approval by USEPA Region VIII.

As part of the Air Force's continuing efforts to verify that the above-mentioned non-liquid PCBs do not pose a significant risk to human health or the environment, five LFs, not including LF C-23, have ongoing long-term groundwater monitoring to allow further evaluation of the potential for impacts from non-liquid PCBs (and related constituents) at all LFs. The results, which to-date have been below action levels, will be used to evaluate the need, if any, for further action at the LFs. LF C-23 was not recommended for long-term monitoring, based on an evaluation of past PCB investigations.

Low concentrations of total PCBs (0.05 ppm) were identified in representative samples of the HICS inner cable components, a short section of which is buried at LF C-23. As a result, the following deed restriction applies:

If HICS cabling is removed (at the landowner's discretion and effort), the covering should not be burned because of the potential to release carbon monoxide from polysulfide components within the inner covering.

Liquid Polychlorinated Biphenyls In Soil (CAS# 11097-69-1). Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. The sump pump outfall soil was sampled between 1998 and 2000 to assess the potential of a liquid PCB release. Concentrations for PCBs ranged from non-detect to 4.1 ppm (well below the USEPA's cleanup action level of 50 ppm) and no remedial action was required.

8.3. Certification Of Asbestos-Containing Material (ACM)

The Real Property on LF C-23 associated with the 446 MS, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

At the LFs, the only item known to contain asbestos was the exhaust system for the diesel electric unit, which was removed as part of site dismantlement. The coatings found on some buried structures (such as the LEB access shaft) at the LFs may contain asbestos. None of the tanks at the LF sites tested positive for asbestos. Any asbestos at the LFs was buried as part of the subsurface structure (disposed of in place, on site). Access to these ACM remnants by future owners is limited by restrictions on subsurface development due to PCBs (see PCB Certification, Section 8.2).

Subject to the above constraints, the property containing the former LF C-23 is safe for human health and the environment.

Certified by: Randy McCart October 16, 2005
Randy McCart
Project Manager
LABAT-ANDERSON INCORPORATED
Bellevue, Nebraska
Date

Approved by: _____
Gary T. Maher, GS-15
Chief, Environmental Division
Headquarters U.S. Air Force Space Command
Peterson Air Force Base, Colorado
Date

APPENDIX A -- MAPS AND PHOTOGRAPHS

- | | |
|---------------|--|
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| Figure C-23-2 | Site Map of Former Launch Facility C-23 |
| Figure C-23-3 | View of Former Launch Facility C-23 Facing West |
| Figure C-23-4 | View of Diesel Tank, Former Launch Facility C-23 |

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ENVIRONMENTAL BASELINE SURVEY

Relinquishment of Property and Termination of Easements for Missile Alert Facility A-0, 446th Missile Squadron, Minuteman III Intercontinental Ballistic Missile System, Grand Forks Air Force Base, North Dakota

The United States Air Force (USAF) proposes to relinquish its jurisdiction over Missile Alert Facility (MAF) A-0 used for the Minuteman (MM) III Intercontinental Ballistic Missile (ICBM) system at Grand Forks Air Force Base (AFB), North Dakota. The MAF A-0 is one of 165 land components that made up the missile system. The Air Force will offer the land for sale to the public, and terminate various easements and licenses that were executed to support the MM III system. First priority of consideration is to current adjacent landowners, who must pay fair market value.

This Environmental Baseline Survey (EBS) is in support of the Air Force's proposal to relinquish MAF A-0. It accompanies an EBS on the entire 446th Missile Squadron (446 MS). The 446 MS EBS provides general information pertaining to activities and conditions that are common to all missile sites within the MS, including survey methodology, history and current use, and squadron-wide information pertaining to environmental setting, hazardous substances, and environmental investigations and sampling. The 446 MS EBS is incorporated by reference. This MAF A-0 EBS provides site-specific information regarding the legal property description, environmental conditions, sampling results (if applicable), adjacent properties, compliance issues, the category finding, and recommendations. Site-specific figures, contained in Appendix A of this EBS, include: a regional map showing topography, water and wetlands (if present), and other features (Figure A-0-1); a site map also showing relevant topographic features, along with structures and sampling locations (Figure A-0-2); and photographs taken during the site inspection (Figure A-0-3 and following).

The EBSs were prepared in accordance with Air Force Instruction (AFI) 32-7066, *Environmental Baseline Surveys in Real Estate Transactions* (April 25, 1994), American Standards for Testing Materials (ASTM) publications E 1527-00, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, and E 1528-00, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*.

1. PURPOSE FOR THE ENVIRONMENTAL BASELINE SURVEY

The purpose of this EBS is to identify and document environmental conditions at MAF A-0, in order to make decisions in connection with a property transfer.

2. SURVEY METHODOLOGY

A discussion of the general survey methodology (approach, site inspections, personnel interviews, documents reviewed, and other information sources) is provided in the 446 MS EBS. Site-specific sampling results are presented within this EBS.

3. FINDINGS FOR SUBJECT PROPERTY

MAF A-0 is located in north-central Cavalier County, North Dakota, 7 miles west and 4 miles north of the town of Langdon and 79 air-miles northwest of Grand Forks AFB. Topographically, the site is on a flat to gently rolling glacial till plain that has approximately 20 feet of relief in the surrounding area (see Figure A-0-1). Regional drainage is poorly to moderately developed by north and northwest-trending intermittent streams. Small, undrained depressions are common throughout the

area. The site is in a gently undulating, cultivated field. Maximum relief within the site area is approximately 10 feet. Gravel pits lie one mile southwest of MAF A-0 (USGS, 1970d).

3.1. History and Current Use

The history of the site is discussed in the 446 MS EBS. The site contains approximately 21.34 acres. The legal description is found in the real property records at Grand Forks AFB.

An unnamed county road borders the site on the south (see Figure A-0-2). The U.S. Air Force boundary extends to the middle of this county road (USACE, 1964). There are no Federal or State highways adjacent to MAF A-0.

There are three easements at this site for overhead power lines. These are located in Township 161 North, Range 61 West, Sections 12 and 13 (about $\frac{3}{4}$ mile east and 2 miles south of the site). Two of the easements cover an area of 3.03 acres each, and the third covers 2.96 acres (USACE, 1971). Verification of the boundaries of these easements and their disposition, as well as a more detailed legal description, title documentation, and information on the termination of easements, will be found in the Declaration of Excess prepared by the U.S. Air Force and the U.S. Army Corps of Engineers.

3.2. Environmental Setting

3.2.1. Site Inspection Summary

Figure A-0-2 shows a view of the former MAF. The site is bordered on all sides by agricultural fields. The sewage lagoon has been closed and the ground has been graded (see Figure A-0-4). Rock that bordered the closed sewage lagoon has been placed in three piles, 8 feet tall and 15 feet in diameter, adjacent to the closed lagoon. There were power poles inside and outside of the fence surrounding the MAF.

Two aboveground propane storage tanks were located near the garage at the MAF. These tanks were active until Fall 2001, maintaining heat in the launch control support building (LCSB). An inspection of the LCSB and garage found an unconnected gas furnace and a gas pump stored in the garage. The air conditioner at the LCSB was still being maintained and contained freon, which was later removed (Vetter, 2001). The diesel tank inside the LCSB had been removed. There were no signs of hazardous materials remaining in the garage or LCSB. In September 2005, Grand Forks AFB personnel verified that the sites are still clean, with no spills or dumping (Koop, 2005).

3.2.2. Geology

In 1963, prior to construction of the MAF, three boreholes were drilled at the site to collect information on stratigraphy and groundwater at the site. One hole was drilled near the location for the launch control equipment building (LCEB) to a depth of 130 feet. Another hole was drilled near the location of the launch control center (LCC) to a depth of 100 feet. The final hole was drilled near the water storage tank located under the LCSB to a depth of 80 feet. Glacial overburden at the site extends to depths of 18 to 20 feet. The material at the LCEB and water tank locations consists of slightly organic silt to two feet underlain by sandy to silty clay to 13 feet and clay with numerous shale fragments to 20 and 18 feet, respectively. At the LCC, the material consists of sandy silt to 7 feet underlain by sandy to silty clay that contains a thin sand unit from 12 to 14 feet. Bedrock encountered at depths of 18 to 20 feet is the Pierre Formation of Cretaceous age, consisting of brittle, dark gray shale to the total depth of the borings. The shale is highly to moderately fractured to a depth of 88 feet and slightly fractured and bentonitic in part below this depth (USAF, 1963).

3.2.3. Soil

This site contains four United States Department of Agriculture (USDA) soil series (Cavour-Cresbard loam, Easby loam, Hamerly-Tonka loams, and Vallers-Hamerly loams) consisting of various layers of loam, clay loam, and silty clay loam. The Hamerly-Tonka and Vallers-Hamerly loams have seasonal high water tables ranging from 0.5 feet above the surface to 4.0 feet below the surface from April through July. The Easby loam, located near the southeast corner of the property, has a seasonal high water table from 4 to 6 feet from September to June. The Cavour loam has a seasonal high water table of greater than 6 feet. Permeability ranges from very slow to moderate. The rate of water movement in the soil is slow to very slow. The Tonka, Vallers, and Easby are hydric soils that experience saturation and ponding. None of these soils experience flooding (USDA, 1990).

3.2.4. Hydrology

The average depth to groundwater at MAF A-0 is 6 feet (USAF, 1963). There are no intermittent lakes within 1,500 feet or perennial lakes within 2,500 feet of MAF A-0. An unnamed intermittent stream located about 20 feet southeast of the southeast corner of the MAF (see Figure A-0-2) drains into Mulberry Creek. Both streams are within the Pembina River Drainage Basin (USGS hydrologic unit catalog 09020313) (USGS, 2001).

3.2.5. Wetlands

Federally delineated wetlands under the National Wetland Inventory are located 50 feet southeast and 1,240 feet southwest of MAF A-0 (USFWS, 2001). There are no delineated wetlands on Air Force property. See Figures A-0-1 and A-0-2.

3.3. Hazardous Substances

Hazardous materials (including sodium chromate solution, PCBs, chromium, mercury, cadmium, and lead) were used at the MAF for operation of the facility, as well as for maintaining and cleaning the MAF. All hazardous materials have been removed from the site with the exception of liquid propane, which was stored in an aboveground tank and was used to heat the facility. The tank and contents will be left for the future property owners. MAF A-0 is listed as a Resource Conservation and Recovery Information System (RCRIS) site where hazardous waste (including battery acid, paint and solvent waste, and sodium chromate solution) was generated or temporarily stored. During the inspection in October 2000, no evidence of hazardous waste was present.

3.4. Installation Restoration Program

MAF A-0 was sampled during a site investigation for the 446 MS. Three types of samples were collected and analyzed for this site: sewage lagoon sludge sample, soil sample south of the MAF, and wastewater samples from primary and secondary lagoon. The samples were analyzed for priority pollutant metals (PPM), molybdenum, phosphorus, and potassium; all analytes were below regulatory limits. Seven sludge samples were tested for fecal coliform, and were below regulatory limits (USAF, 1999b). This site is not part of the Grand Forks AFB Installation Restoration Program and no remediation is required.

3.5. Storage Tanks

During a tank testing program a leaking underground storage tank (UST) was located at the MAF (see Table A-0-1), but the cleanup was completed in 1994. As part of the dismantlement process, the 7,000 gallon water tank and the 40,000-gallon demineralized water tank were left in place. The deep-buried 15,000-gallon diesel fuel tank near the LCC was closed in place in accordance with state

guidelines (cleaned and filled with sand). Soil testing was conducted adjacent to the diesel tank at the time of closure and did not detect hydrocarbons (USAF, 2000c). The two propane tanks behind the garage remain and will be left for the future owner of the property. All other tanks were removed. Sampling conducted in 1999 found no contamination (USAF, 1999b). No contamination was observed during the site inspection during October 2000.

Table A-0-1 Leaking Underground Storage Tank							
No.	Facility ID	Location	Owner Name	Owner Address	Date	Status	County
1	2024 GFAFB	Dresden, ND 58226, MAF A-0	GFAFB	319 CES/CEVC 525 Tuskegee Airmen Blvd Grand Forks AFB, ND 58205	10/26/94 10/27/94	Confirmed Release Site Cleanup Completed	Grand Forks
Source: NDDH, 2002b							

3.6. Oil/Water Separators

There were no oil/water separators at MAF A-0.

3.7. Pesticides

Pesticides were used at regular intervals between the early 1960s and the late 1990s to control weed and plant growth (herbicides) and insect pests (insecticides) at MAF A-0. Modeling of pesticide degradation based on application rates of applied formulations indicated that only negligible residues would remain within one year of application (USAF, 1999a). Recent spot treatments have been used sporadically to supplement mowing for noxious weed control. Since these treatments involved smaller treatment areas and lower application rates than the previously modeled applications, they would also be predicted to result in negligible pesticide residues at MAF A-0 after one year.

3.8. Medical or Biohazardous Waste

Air Force personnel temporarily lived at MAF A-0 and occasionally generated medical waste. All solid waste (including medical waste) generated at the site was gathered and transported for disposal at Grand Forks AFB. There were no biohazardous wastes associated with the MAF. Consequently, there is no risk of exposure to medical or biohazardous wastes at the dismantled site.

3.9. Ordnance

Security forces were present at the MAFs to protect the facility and surrounding LFs. All weapons and ordnance used to protect the sites have been removed from the MAFs. There are no remaining munitions at MAF A-0.

3.10. Radioactive Waste

Neither radioactive waste nor mixed waste (radioactive and hazardous waste combined) was generated or stored at MAF A-0.

3.11. Solid Waste

Solid waste generated at MAF A-0 was collected and returned to Grand Forks AFB for proper disposal. During dismantlement activities, any solid wastes generated (except construction rubble) were collected and disposed off-site by a government contractor. Construction rubble was placed down the elevator shaft during dismantlement. The shaft was subsequently sealed with concrete to limit access to the subsurface. Although the site may qualify as an inert solid waste landfill under *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01, a permit was not needed because all construction rubble placed in the elevator shaft was generated on Air Force property. All appropriate design criteria were followed for a permit-exempt inert solid waste landfill according to the *North Dakota Administrative Code* 33-20-02.01-01 and 33-20-05.01. There are no other solid waste disposal sites at MAF A-0 except for the primary and secondary wastewater lagoons (discussed in Section 3.13).

3.12. Groundwater

At MAF A-0, there are deep-buried USTs that may have a PCB coating. Because of the potential to leach PCBs into shallow groundwater, no water wells can be installed at the site (PCBs are discussed in Section 3.16).

3.13. Wastewater Treatment, Collection, and Discharge

At each MAF, including A-0, a system was designed to treat, collect, and discharge wastewater. Sewage was collected and pumped to a dual-celled lagoon. The lagoon cells were closed in accordance with State requirements. The sewage lagoon sludge was landfarmed by removing the sludge, setting it aside, and grading the lagoon area. The sludge was then spread over the soil and mixed in with the top six inches of soil (USAF, 1999a; Koop, 2001). At the time of sampling, the primary lagoon had been cleaned out and no sludge remained for sampling. Seven sludge samples were collected from the secondary lagoon. Only two of the seven samples detected fecal coliform, but both were well below regulatory limits. Sludge samples for PPM, molybdenum, ammonia, nitrate, nitrite, percent solids, and total nitrogen, phosphorus, and potassium were all below regulatory limits according to 40 CFR 503. Surface water samples for PPM, molybdenum, phosphorus, potassium, biochemical oxygen demand, total suspended solids, oil and grease, and pH were all below regulatory limits (USAF, 1999b).

3.14. Drinking Water Quality

The potable well at MAF A-0 has been closed in accordance with North Dakota requirements (Vetter, 2001). The well had not been used for several years because of its marginal quality, and water at the MAF was provided by a rural water system and piped to the site. The external coating of the 15,000-gallon UST closed in place may contain PCBs and negligibly affect shallow groundwater.

3.15. Asbestos

The diesel electric unit (DEU) exhaust systems in the LCSB and LCEB contain asbestos insulation under a metal sheet covering. MAF A-0 is assumed to contain asbestos at the elbows and joints of water pipe insulation on the heating system (asbestos sampling results indicated that molded pipe joints on the heating system contained non-friable asbestos). Additional sources of asbestos include floor tiling (at the LCSB and the LCC), and vinyl base mastic and vinyl floor tiling in a closet at the LCSB (Hustad, 1997; Rudolf, 1998). The external coating of the 15,000-gallon UST closed in place may contain asbestos.

3.16. Polychlorinated Biphenyls

All equipment (e.g., electric filters, panels, and capacitors) that potentially contained PCBs was removed during the environmental safing process. Light ballasts that potentially contain PCBs at the LCSB were removed and replaced only because of failure; some remaining ballasts may contain PCBs.

Testing revealed a PCB coating on some tanks at MAFs (Eggleston, 1997). The heating oil tanks (TK-106) and generator tanks (TK-107) were removed at MAF A-0. Those tanks that were removed or replaced were tested for PCBs and all tested positive (Hustad, 1998). Soil samples taken from around the tanks found PCBs at low levels ranging from non-detect to 14 ppm (Maxim, 1995, USAF, 1994, Maxim, 1996, USPCI, 1996). These levels are below the criteria level of 100 ppm for cleanup at a low occupancy (rural) site with restricted access (40 CFR 761). The coating on the deep-buried 15,000 gallon diesel fuel UST that was closed in place at MAF A-0 might contain PCBs (Vetter, 2001). A more complete discussion of in-situ PCB disposal and sampling is included in the 446 MS EBS.

3.17. Radon

The region can present a risk of exposure from naturally occurring radon. Subsurface areas are a concern for radon gas to build up if structures are inadequately ventilated. The United States Environmental Protection Agency (USEPA)-recommended action level is 4 picocuries per liter (pCi/l); on-base readings at Grand Forks AFB have ranged from about 4 to 20 pCi/l (Koop, 2001). The LCC and LCEB at MAF A-0 were hermetically sealed areas with filtration units for radioactive, biological, and chemical elements. The LCSB at the site did not contain a basement. No radon monitoring was conducted at the site because the subsurface structures were well ventilated (Rudolf, 2001).

3.18. Lead-based Paint

Lead-based paint (LBP) may have been used on interior and exterior surfaces in buildings constructed prior to 1978. LBP in the LCSB was removed prior to dismantlement. The only LBP known to remain at the MAF is inaccessible underground in the former LCC (Vetter, 2001). However, the MAF buildings were constructed in the early 1960s and are assumed to contain LBP, although no testing has been conducted. Since LBP has not been used since 1978, it is almost certain that LBP in the above-ground structures has been covered by non-lead-containing paint in recent years. Future renovation (such as extensive sanding of painted surfaces, or cutting into walls) or demolition of the MAF buildings could expose workers and/or residents to lead. MAF structures do not meet the definition of target housing for LBP regulation.

Soil sampling for lead found 7.4 ppm; the sampling location is shown on Figure A-0-2. Although a standard has not been established for rural areas, these values are well below the urban residential standard of 1,200 ppm.

The paint may also have contained other heavy metals, such as cadmium, chromium and mercury. Water samples from the lagoons prior to closure did not detect cadmium, chromium, mercury, or lead (USAF, 1999b).

4. FINDINGS FOR ADJACENT PROPERTIES

The site is surrounded by agricultural areas used for crop production. There are no National Priority List sites in North Dakota. No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), treatment, storage, and/or disposal (TSD), or Emergency Response Notification System (ERNS) sites are located within search distances, as defined by

ASTM Standards (NRC, 2005; NDDH, 2002; NDDH, 2005; USEPA, 2005a; USEPA, 2005b; USEPA, 2005c; USEPA, 2005d).

5. APPLICABLE REGULATORY COMPLIANCE ISSUES

Compliance issues are environmental conditions that may affect the transfer or use of the subject property. These conditions include historic property, prehistoric sites, traditional cultural resources, sensitive habitats, threatened or endangered species, wetlands, floodplains, seismic conditions, mineral resources, prime and unique farmlands or timberlands, and water rights. There are no prehistoric or traditional cultural resources at the site.

5.1. Historic Property

The State Historical Society of North Dakota (SHSND) and the Advisory Council were consulted as part of the Environmental Impact Statement for the Minuteman III Dismantlement (USAF, 1999a). MAF A-0 was considered eligible for listing in the National Register of Historic Places. However, the U.S. Air Force and the SHSND have negotiated a Programmatic Agreement to retain a MAF (O-0) and LF (N-33) in the 448 MS. No restrictions for transfer of the property at MAF A-0 are required.

5.2. Sensitive Habitats

MAF A-0 is not adjacent to or within any protected areas, such as national wildlife refuges, national or state wildlife management areas, or waterfowl protection areas. No disturbance to protected habitats should occur if the land is sold; therefore, no restrictions for the transfer of the property are required.

5.3. Threatened and Endangered Species

No known threatened or endangered plant or animal species, or suitable habitat for such species, occur within the MAF (USAF, 1999a). No impacts to any protected species or their habitat should occur if the property is sold; therefore, no restrictions are required.

5.4. Wetlands

The National Wetland Inventory has identified wetlands within 1,500 feet of the Air Force property boundary (see Section 3.5.4 and Appendix A). Although it is unlikely that a future owner of this site would disturb these wetlands, they may be subject to the *Clean Water Act*. No disturbance would result from the actual transfer of property.

5.5. Floodplains

MAF A-0 is not within an area designated as a 100-year floodplain (USAF, 1999a). No impacts to any type of floodplain would occur if the property is sold; therefore, no restrictions are required.

5.6. Seismic Conditions

MAF A-0 is situated in Seismic Hazard Zone 0. Seismic conditions are not a concern in the vicinity of the MAF; therefore, no restrictions are required.

5.7. Mineral Resources

No economically recoverable mineral resources have been identified in the vicinity of the MAF; therefore, no restrictions are required.

5.8. Prime and Unique Farmlands or Timberlands

Part of this property is within prime and unique farmlands, but no timberlands have been designated in the vicinity of the LF. The Hamerly-Tonka complex is found only on the southwest corner of the property. The portion of this site designated as prime farmland is subject to the *Farmland Protection Policy Act* (Public Law 97-98).

5.9. Water Rights

If any water rights were acquired, they will be addressed in the Report of Excess to be prepared for each site by the U.S. Air Force and the U.S. Army Corps of Engineers (Noordam, 2001).

6. CONCLUSIONS

The following finding is based on a site inspection of MAF A-0 and a review of the EBS. The discussion includes property categorization factors, hazardous substances and facility disclosure factors, and the results of federal and state database searches. The MAF A-0 has been designated as:

Category 4 – Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions have been taken.

No data gaps have been identified.

7. RECOMMENDATIONS

The findings of this EBS indicate minimal potential for environmental contamination at MAF A-0. Therefore, it is recommended that the Air Force pursue the sale of the MAF A-0 property associated with the 446 MS of the former Minuteman III Missile System at Grand Forks AFB, ND.

Due to the presence of PCBs in coatings used on certain structures, there is a potential for low levels of PCB contamination in groundwater, and monitoring is underway. Consequently, there is a restriction on drilling to supply water, and this restriction should be disclosed to potential purchasers.

The portion of this land designated as prime farmland (discussed in Section 5.8) is subject to the *Farmland Protection Policy Act* (Public Law 97-98). Restrictions would apply to the conversion of the land to a non-agricultural use.

8. CERTIFICATIONS

This section summarizes the contamination issues that will result in deed restrictions upon transfer of the properties of the 446 MS. The signed certifications are found in the site-specific EBSs in Volume II of this document.

A search of Air Force files has revealed that hazardous substances, as that term is defined by the Air Force and in CERCLA, as amended, were used or stored for one year or more, known to have been released, or were disposed of on MAFs associated with the 446 Missile Squadron, Grand Forks AFB, ND, as described below. Section 8.1 addresses hazardous substances; PCBs and asbestos-containing materials (ACM) are addressed separately in Sections 8.2 and 8.3, respectively.

8.1. HAZARDOUS SUBSTANCES

The following notice provides the available information discovered as a result of a search of Air Force files pertaining to hazardous substances known to have been stored, released, or disposed of at the Site:

- **Petroleum Constituents.** Petroleum-containing materials were used at each MAF from approximately 1964 to 1998. The petroleum diesel USTs were closed in place in 1999 and

2000. Closure documentation was submitted to NDDH, who responded that the closure reports were satisfactory and that no further action will be required (NDDH, 2004).

- **Lead-Based Paint (LBP).** Lead-based paint was used on interior and exterior surfaces in buildings constructed or repainted prior to 1978. As noted in Section 3.16 of the 446 MS EBS, the only LBP remaining at the MAF is inaccessible below grade in the former LCC. Traces of LBP may remain around door posts and jambs within the LCSB, but would be below the contaminant regulatory level of 5.0 mg/l.
- **Priority Pollutant List Metals (PPL).** Soil samples for PPL metals (silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc) were collected near the sewage lagoons at all MAFs. All samples detecting the presence of metals were consistent with local background concentrations and/or were less than levels requiring action by the NDDH.
- **Chromium (CAS# 7440-47-3).** An unquantified amount of chromium may have been contained in LBP used as coatings for underground structures, and if present is inaccessible below grade in the former LCC; sampling results were below action levels. A film of chromium coating was found in a filter in the LCEB air distribution system; the filters were removed and disposed off-site as hazardous waste.
- **Miscellaneous.** Limited amounts of hydraulic fluid, lead, mercury, cadmium, pesticides, solvents, coolants, paints, ordnance, and lead acid batteries may have been used and/or stored at each MAF. All materials were removed during deactivation, and no releases other than those deemed *de minimis* were identified. No concentrations of these and/or related constituents above their respective action levels were identified during environmental testing.

The Air Force has taken all remedial action necessary to protect human health and the environment with respect to any hazardous substances released, disposed of, or stored at the LFs, which are identified as excess to U.S. Air Force requirements and proposed for disposal.

8.2. POLYCHLORINATED BIPHENYLS (PCB)

The Real Property at MAFs associated with the former 446 MS, Grand Forks AFB, ND, is subject to restrictions due to PCBs as outlined below:

Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. No PCBs were detected in soil sampling conducted at the MAFs between 1998 and 2000.

Non-liquid Polychlorinated Biphenyls (CAS# 1336-36-3). Non-liquid PCBs were used in waterproofing materials during construction at the MAF beginning in 1964. Non-liquid PCBs are assumed to still be present in waterproofing materials at the MAF based on representative sampling. Testing in 1997 revealed a PCB coating on some tanks at MAFs; shallow buried tanks were removed from the site. The waterproof coating on one deep buried tank was tested for PCBs and none were detected. These tanks were closed in place. Soils adjacent to the removed tanks had PCB concentrations ranging from non-detect to 14 ppm. All TCLP-PCB concentrations were less than 10 parts per billion (ppb), and ranged from non-detect to 6 ppb. The UST was closed in place and most of the piping and conduit was disposed as *Toxic Substance Control Act*-PCB waste, and a limited amount of piping and conduit remains buried at the site. Low concentrations of total PCBs (0.05 ppm) were identified in representative samples of the HICS inner cable components, a short section of which is buried at each MAF. As a result, the following deed restriction applies:

- If HICS cabling is removed (at the landowner's discretion and effort), the covering should not be burned because of the potential to release carbon monoxide from polysulfide components within the inner covering.

Liquid Polychlorinated Biphenyls In Soil (CAS# 11097-69-1). Liquid PCBs were used in equipment, such as capacitors and filters, when the missile system facilities were operational (1964 to 1998) but were removed during deactivation. The sump pump outfall soil was sampled between 1998 and 2000 to assess the potential of a liquid PCB release. Concentrations for PCBs ranged from non-detect to 4.1 ppm (well below the USEPA's cleanup action level of 50 ppm) and no remedial action was required.

8.3. ASBESTOS-CONTAINING MATERIAL (ACM)

The Real Property on LFs associated with the 446MS, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

The Real Property on each MAF associated with the 446th Missile Squadron, Grand Forks AFB, ND, is in compliance with 40 CFR 61, Part M, as outlined below:

- At the MAFs, the DEU exhaust systems in the LCSB and LCEB contain asbestos insulation under a metal sheet covering. MAFs may also contain asbestos at the elbows and joints of water pipe insulation on the heating system (asbestos sampling indicated that molded pipe joints on the heating system contained non-friable asbestos). Additional sources of asbestos at the MAFs include floor tiling (at the LCSB and the LCC), and vinyl base mastic and vinyl floor tiling in a closet at the LCSB. The external coatings of the buried 15,000-gallon UST closed in place at the MAFs may contain asbestos. No other asbestos-containing materials (ACM) exist at or above grade at the Site.

Certified by:	<i>Randy McCart</i>	October 13, 2005
	Randy McCart Project Manager LABAT-ANDERSON INCORPORATED Bellevue, Nebraska	Date

Approved by:	_____	_____
	Gary T. Maher, GS-15 Chief, Environmental Division Headquarters U.S. Air Force Space Command Peterson Air Force Base, Colorado	Date

APPENDIX A — MAPS AND PHOTOGRAPHS

- Figure A-0-1 Features Surrounding Former Missile Alert Facility A-0
- Figure A-0-2 Site Map of Former Missile Alert Facility A-0
- Figure A-0-3 View of Former Missile Alert Facility A-0 Facing East
- Figure A-0-4 View of Graded Sewage Lagoon at Former Missile Alert Facility A-0 Facing South

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